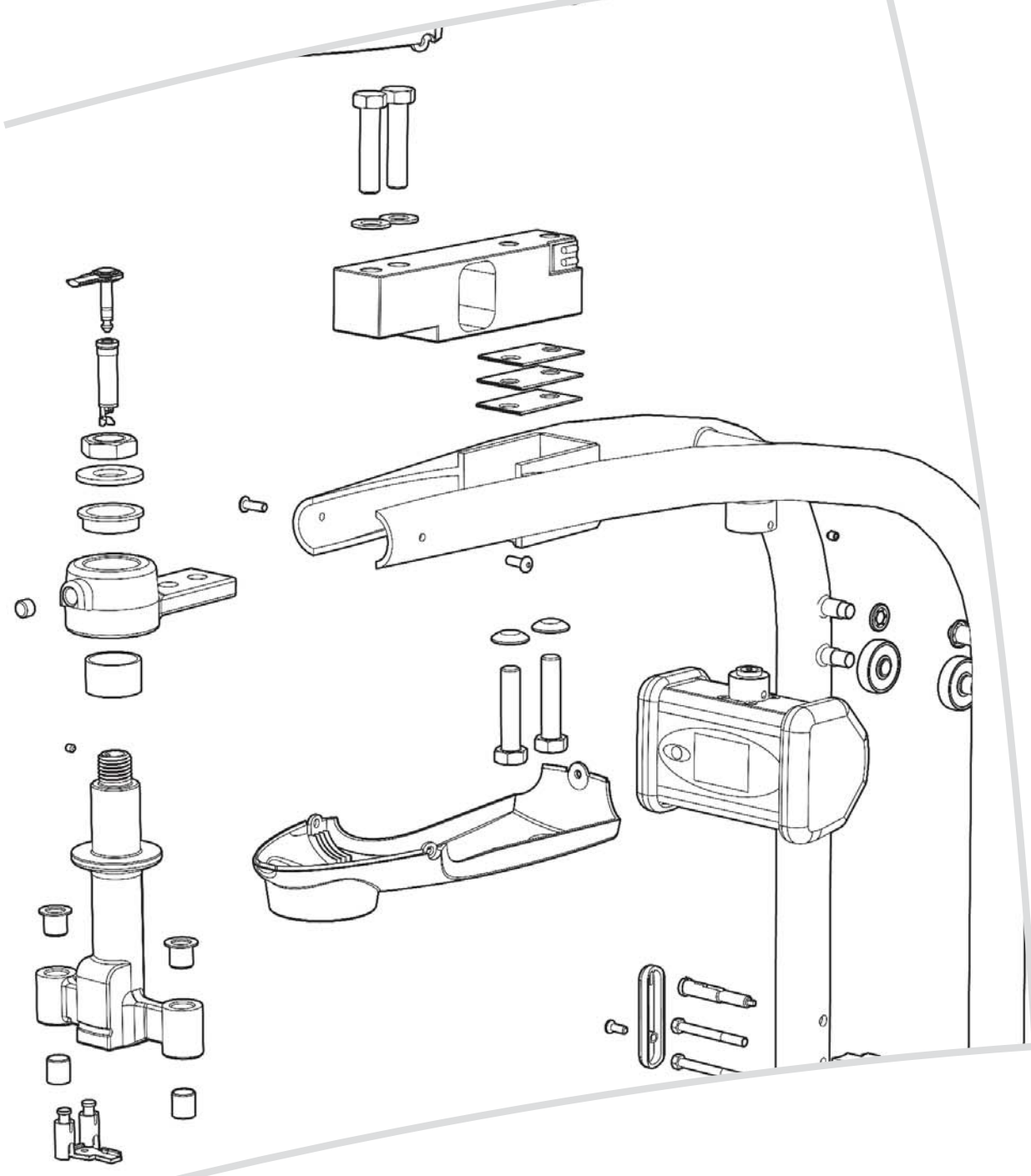
ARJO

MAXI MOVE

MAINTENANCE AND REPAIR MANUAL



For internal use only!

09.KM.00/3GB
August 2006

For technical data, measurements and upgrades not found in this guide, please refer to the Operating Instructions.

CONTENTS:

Product and Technical Description **4**
General **5**
Risk Assessment Checklist for Engineers **6**
Service Matrix **7**
Suggested Tools **8**
Standard tool kit. 8
Recommended Spares **8**
New implementations in Sweden **8**
Loctite Application **9**
Torque Data and Consumable Materials **10**
12 Monthly Service Procedure **16**
Jib and Attachments **19**
Four Point DPS (Combi and Dedicated) 21
Four Point Powered DPS (Combi illustrated) 22
Jib with Scale Fitted (Combi illustrated) 23
Mast Assembly and Push Handle **24**
Chassis Assembly **27**
Sling Checks **28**
Load Test (local requirement) **29**
1. Medium Powered and Non Powered Dynamic Positioning System (DPS) 29
2. Loop Medium Two Hook and Walking Jacket Two Hook 29
3. Loop Small Two Hook 29
4. Loop Large Four Hook 29
5. Large Powered and Non Powered Dynamic Positioning System (DPS) 29
6. Combi Stretcher Frame and Strap Stretcher 29

PCB:s and Wiring Diagram **33**
24 Monthly Service Procedure **36**
Lift Band Removal and Replacement 36
Repair Procedures **43**
Mast Actuator Removal and Replacement 43

Product and Technical Description

The Maxi Move is a mobile patient lifter and is used for transferring patients from bed or chair to the toilet or bath. The hoist has a Safe Working Load (SWL) of 228kg (501 lb): refer to **NOTE**.

NOTE: The SWL will depend on the hoist configuration (attachments) always refer to the maximum SWL label adhered to the lowest rated fitted attachment.

Each Maxi Move is supplied with two 24V rechargeable batteries and a charging unit.

Features of the hoist comprise:

- Emergency lowering button and limit stop switch.
- Emergency stop/reset switch with thermal cut-out.
- Overload current circuit breaker.
- Overload current limit protection in the PCB.
- Up limit switch.
- Down limit/slack tape switch.
- Additional mast keypad.
- Emergency manual wind down.
- Battery condition and machine hours run display.
- Audible low battery warning.

The raising and lowering mechanism comprises an electro mechanical linear actuator powered by 24V DC motor.

The leg opening and closing mechanism comprises a 24V DC motor and single-ended actuator (legs open independently).

The Maxi Move with the ‘Lock & Load’ (combi attachment) has the facility to accommodate:

- A 2 point spreader bar for use with a loop sling to support patients with contracted (restricted movement) or ‘windswept’ (deformed) limbs and walking slings.
- A 2 point loop small.
- A 2 point loop medium.
- A 4 point loop large.
- A 4 point spreader bar Dynamic Positioning System (DPS) for general lifting (small, medium and large).
- A 4 point powered spreader bar Dynamic Positioning System (DPS) for general lifting (medium and large).
- A stretcher system for handling dependent, fragile patients with a minimum of disturbance (SWL 160kg (350 lb)).
- Patient Weighing Scale.

Alternatively the Maxi Move can be a dedicated lifter that is also available with a 200mm extended jib. If fitted with the extended jib this hoist then has a reduced SWL of 130kg (286 lb) with the following options:

- Dynamic Positioning System powered or non-powered (DPS).
- Patient Weighing Scale.

General

A. ARJO strongly advise that only Company Designated parts, which are designed for the purpose, should be used on equipment and other appliances supplied by the Company, to avoid injuries attributable to the use of inadequate parts. The Company's Conditions of sale make specific provision confirming no liability in such circumstances. Our policy is one of continuous development, and we therefore reserve the right to change specifications without notice.

B. **Un- authorised modifications on any ARJO equipment may affect its safety and are in breach of any warranty on it. ARJO will not be held responsible for any accidents, incidents or lack of performance that occur as a result of un-authorised modifications to its products.**

C. If the terms listed below are used in the text their meaning is as follows:

DANGER - Means:	Electrical hazard warning, failure to understand and obey may result in electrical shock.
WARNING - Means:	Failure to understand and obey may result in injury to you or to others.
CAUTION - Means:	Failure to follow these instructions may cause damage to all or parts of the system or equipment.
NOTE - Means:	This is important for the correct use of this system or equipment.

D. Dangerous substances . If using hazardous substances be sure how to handle these and refer to applicable information. In doubt refer to the local authorities for health and safety requirements.

Risk Assessment Checklist for Engineers

WARNING: IF IN DOUBT ASK DO NOT TAKE UNNECESSARY RISKS.

The following assessment **MUST** be made before carrying out servicing, repair work or installations.

- Make sure the work area is adequately sized, suitably lit and at a reasonable temperature.
- The floor surfaces must be free from clutter, unevenness and non-slip.
- Use good engineering and manual handling practices to keep risk of injury at its lowest level.
- Tools and equipment must be kept in good condition.
- Wear protective clothing and eye protection where necessary.
- You should be adequately trained to perform the task.
- Do not manually lift items that could cause personal injury, that is too heavy, hot or sharp.
- You must comply with all local site safety rules, report any incident or accident to the site safety supervisor or equivalent. Use the ARJO reporting procedure.
- If necessary use Hard Surface Wipes (Alcohol Impregnated) to decontaminate a machine before carrying out any work.

  NOTE: The above wipes should be of the type that has proven bactericidal action for disinfecting hard surfaces against MRSA & E.COLI.

- Load tests must only be applied as instructed in the relevant procedure.
- If it is necessary to work from a platform i.e. scaffold, ladders etc to perform a service or installation task make sure the platform is secure and suitable for the task.

- **DANGER – Electrical Shock can kill.**
  Do not perform maintenance tasks on equipment with ‘live’ electrical connections unless absolutely necessary.
  Isolate the power supply <u>before</u> removing plugs, sockets or disconnecting cables.
  Be alert at all times to the dangers of working on electrical equipment that operates on mains supply voltage. Where possible, visually inspect electrical cables and plugs etc. for damage or deterioration before working on equipment.
- Dispose of all waste in appropriate containers.

Service Matrix

Service	12 Monthly	24 Monthly
MAXI MOVE		
Refer to *12 Monthly Service Procedure , page 24*	✓	
Refer to *24 Monthly Service Procedure, page 36*		✓
NON-POWERED AND POWERED DYNAMIC POSITIONING SYSTEM (DPS) 2 HOOK SPREADER BAR (VARIOUS MODELS) 4 HOOK LARGE SPREADER BAR STRETCHER FRAME		
Refer to *Jib and Attachments., page 19*.	✓	
SLINGS		
Refer to *Sling Checks, page 28*	✓	
BATTERY CHARGER		
Visually check the battery charger for loose connectors, damage or deterioration. Recommend replacement if necessary.	✓	
LOAD TEST (LOCAL REQUIREMENT)		
Refer to Load Test (local requirement), *page 29*	✓	

Refer to Preventive Maintenance Schedule 04.KM.01 for a checklist of action/check points for both customer and service technician.

Suggested Tools

Standard tool kit.

Special Tool ST252.
2 x 20kg weights ST219.
Socket Allen Key: (4mm ST82) (5mm ST274) (6mm ST55) (8mm ST87).
Drift ST288.
Ball End Allen Key (4mm) ST292.
Starlock Washer Installation Tool (ST295).
Sling Clip Gauge ST331.
Load Test Equipment: refer to Section 11.0.

Recommended Spares

Refer to PARTS LIST 05.KM.00

New implementations in Sweden

- O-ring on actuator guide bush including lubrication of o-ring and inner mast. See:Technical Bulletin SE57 (noise reduction)
- BDI version 3 (from serial number SEE0610423). See:Technical Bulletin SE57
- PCB new version 5 (from serial number SEE0618119). See:Technical Bulletin SE57
- Spacer of nylon together with new steel spacer for actuator attachment (noise reduction).
- Stop screw securing nut on dedicated loop without DPS (Loctite should be applied as screw has no pre-applied locking) .See page 15.
- Stop screw securing nut on dedicated DPS loop, Combi Jibs extended to 8 mm (safety reasons). See page 13 and 15.
- New version of Jackplug (reinforced version)
- Covers for scale jib with five screws instead of three screws (to replace either cover on old versions will need both new top and bottom cover and two new screws).
- The welding of the two steering pins on the detachable combi hanger bar has been reinforced.
- Plastic spacer added for the micro switch mechanism on top of the inner mast in order to prevent the micro switches from “missing” the top mounting and not being activated.

Loctite Application

Refer to the manufacturer instructions on the container before use, in addition to the following information.

(a) Procedure for the correct use of Loctite 242 and Loctite 243 (Colour blue) – Threadlocking:

- Clean both of the joint faces with Loctite 7063 Cleaner or a lint-free cloth moistened with Acetone or another suitable volatile solvent.

  NOTE: Because Loctite 243 is oil tolerant it is not necessary to prepare to the same standard of oil free cleanliness as for Loctite 242.

- Apply Loctite 243 sparingly but sufficient to fill all engaged threads. (This product performs best in thin bond gaps (0.05 mm)).
- Install the threaded components and where known, torque to the applicable torque figure. If the torque figure is not known tighten to a firm fixing.
- Clean off any unwanted adhesive.
- Allow the Loctite 243 to cure before subjecting to load.

  NOTE: The cure time will depend on the materials used, the ambient temperature and the bond line gap.

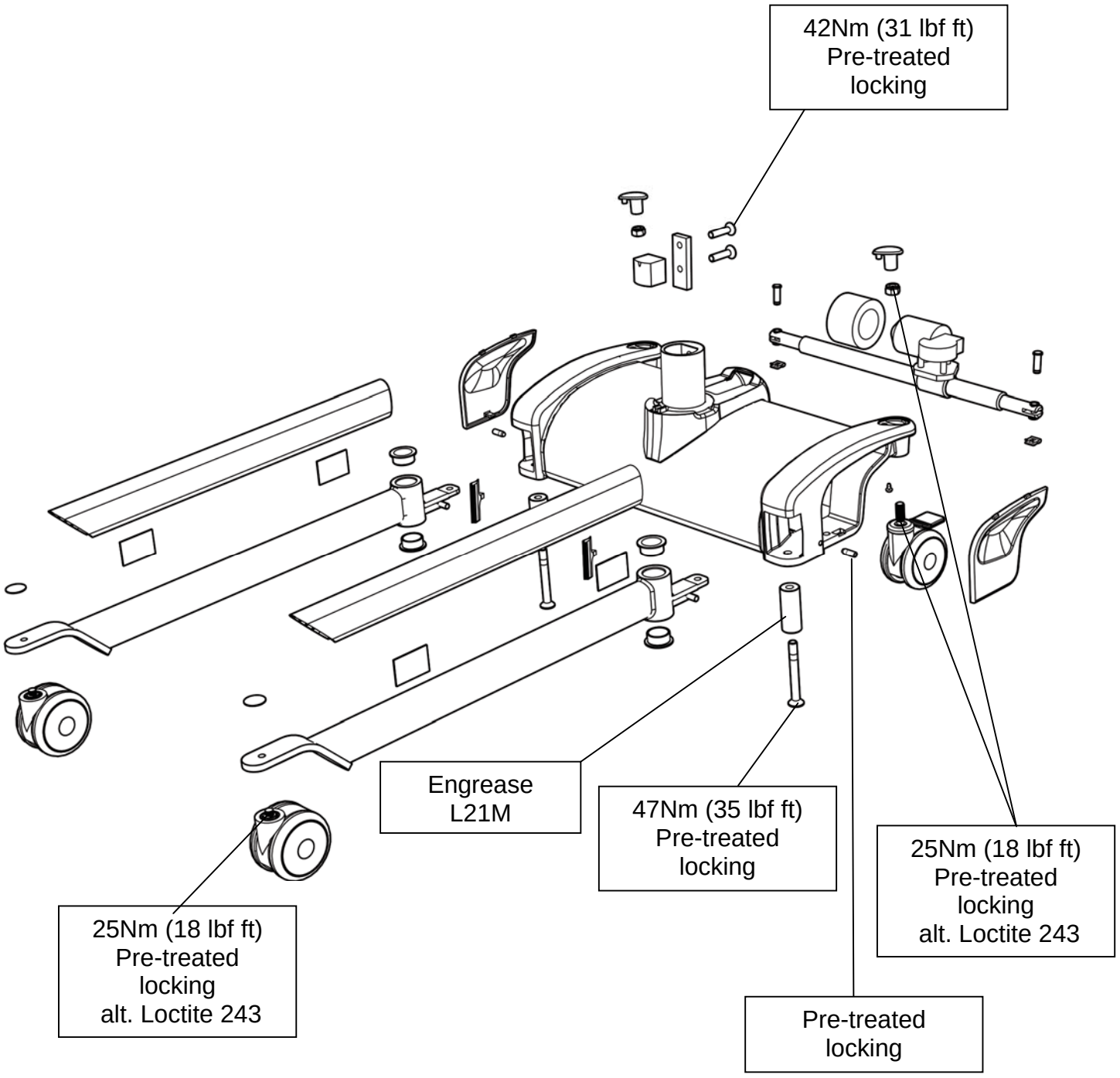
- Where the cure speed is unacceptably long, or large gaps are present, applying Loctite Activator ‘N’ or ‘T’ to the surface will improve the cure speed.

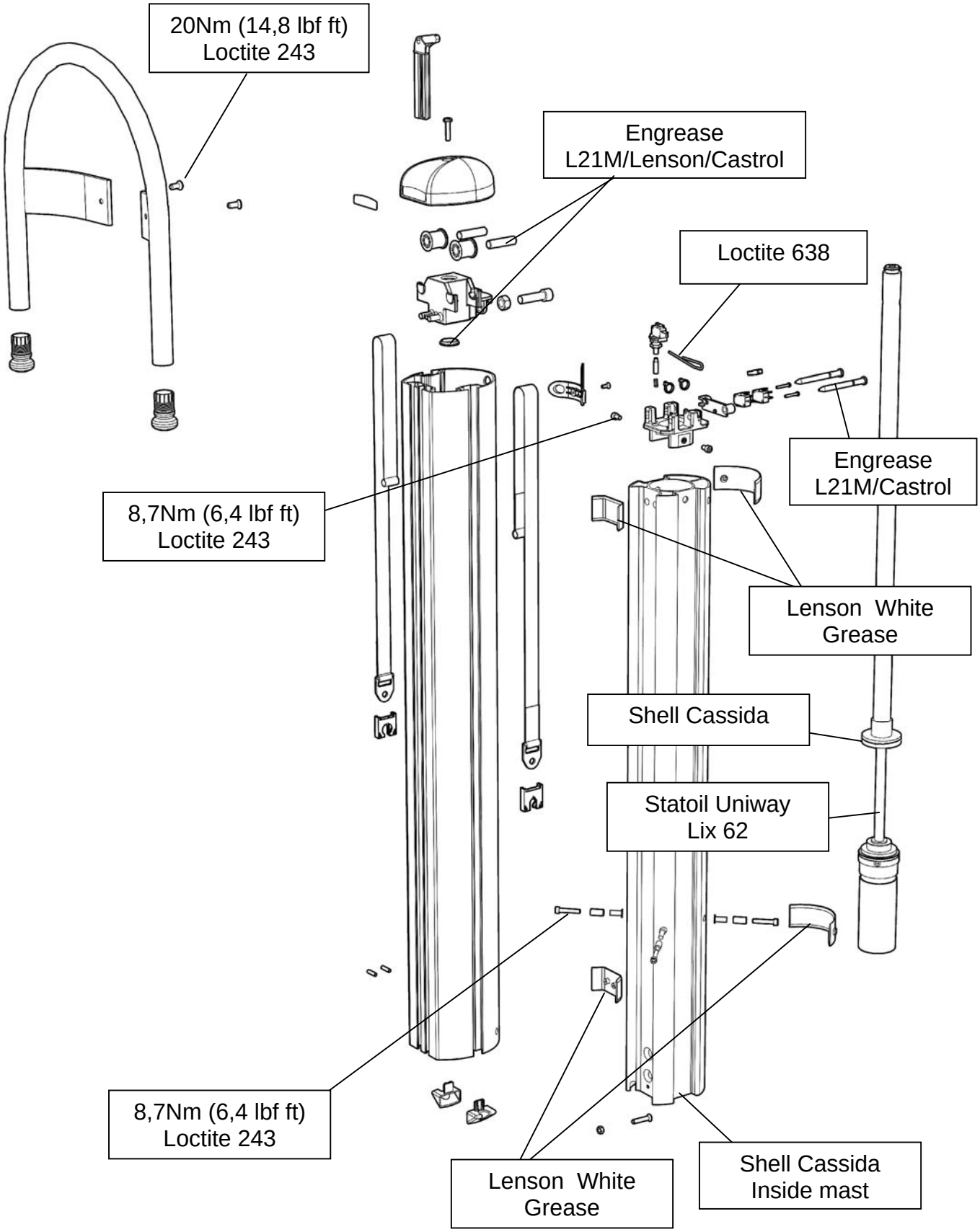
For general Loctite specifications and application details: refer to Loctite manufactures instructions.

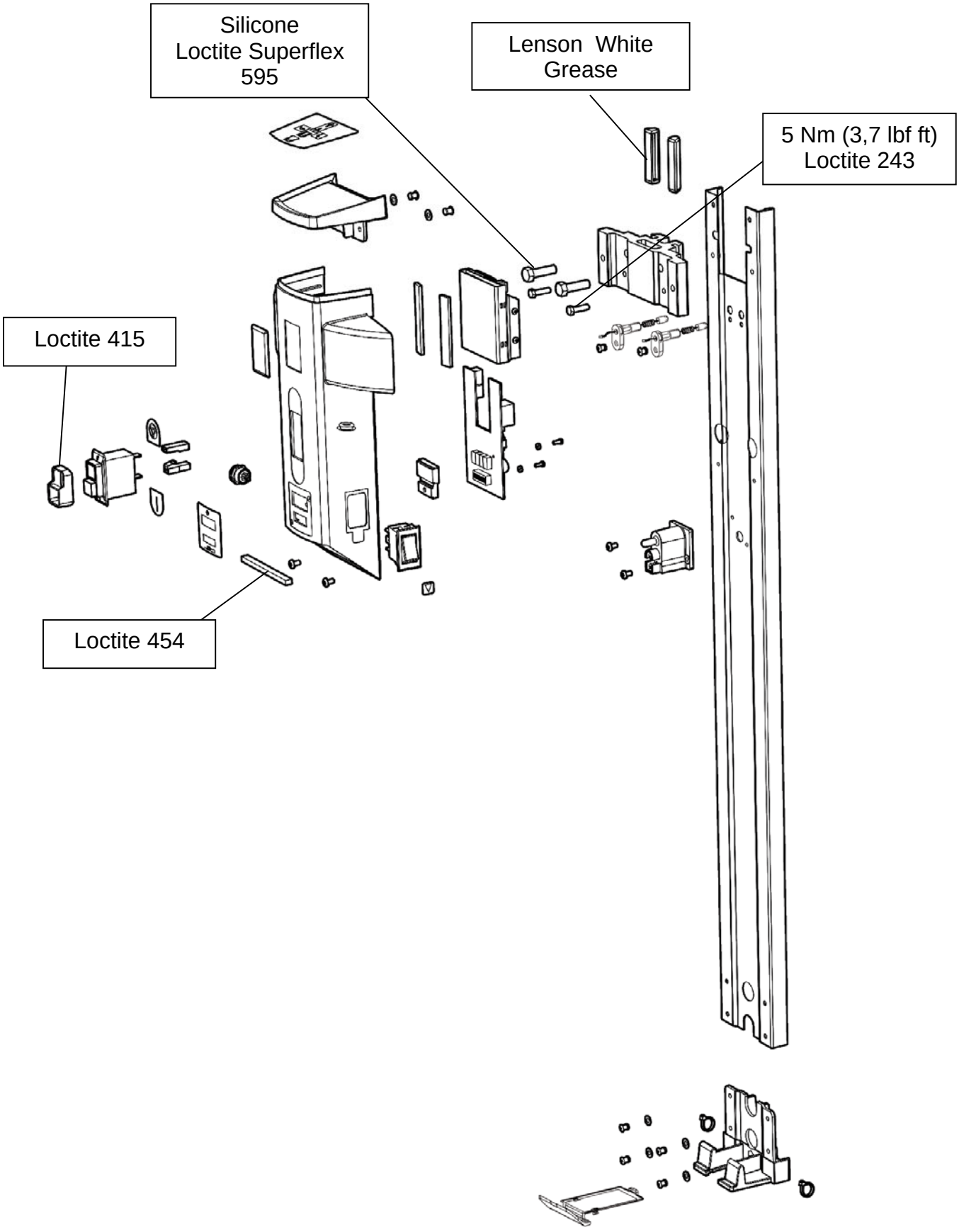
Torque Data and Consumable Materials

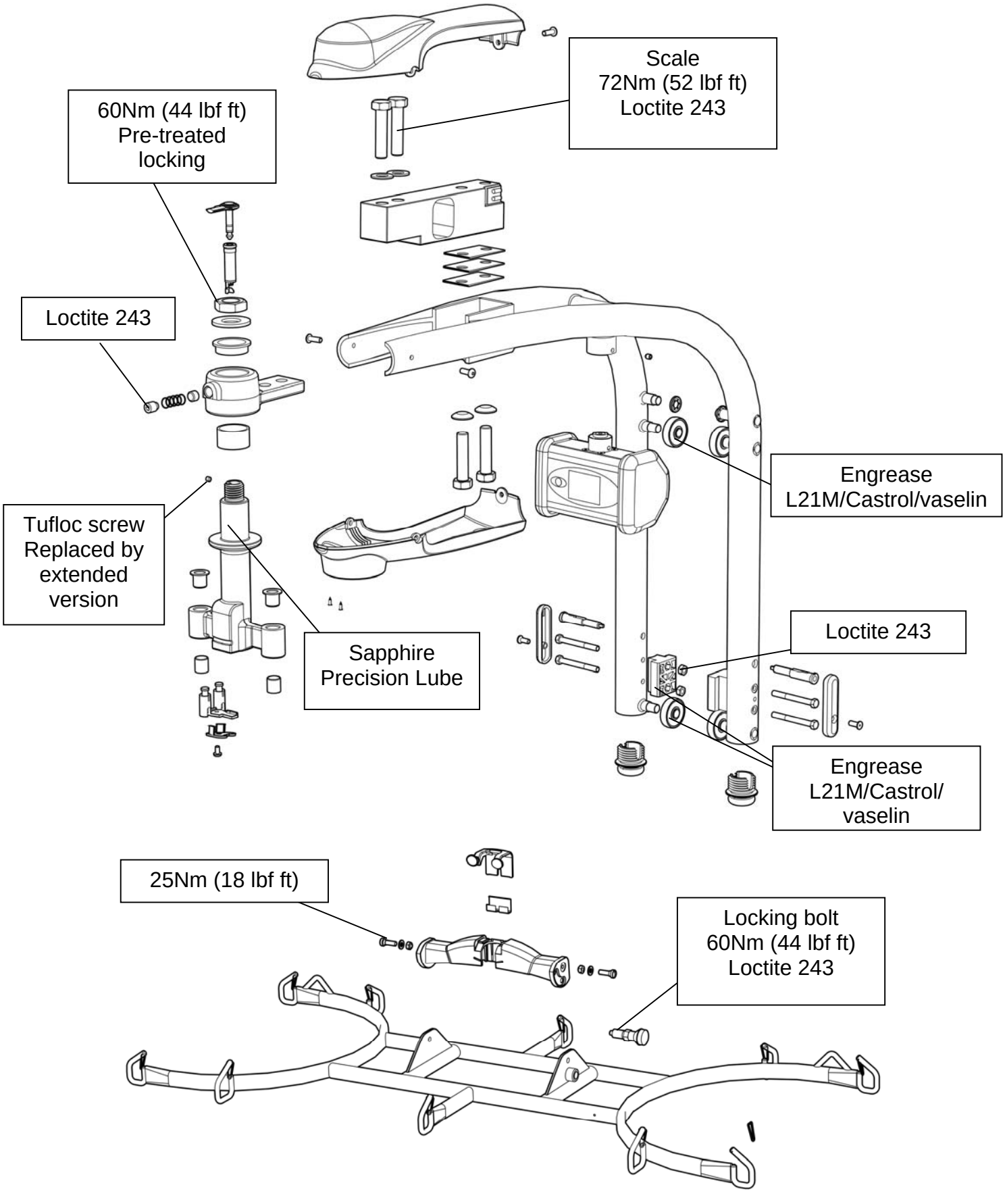
NOTE: It is acceptable to use alternative equivalents to the product items listed. The alternative equivalents must be authorised by the Technical Support department as suitable for use

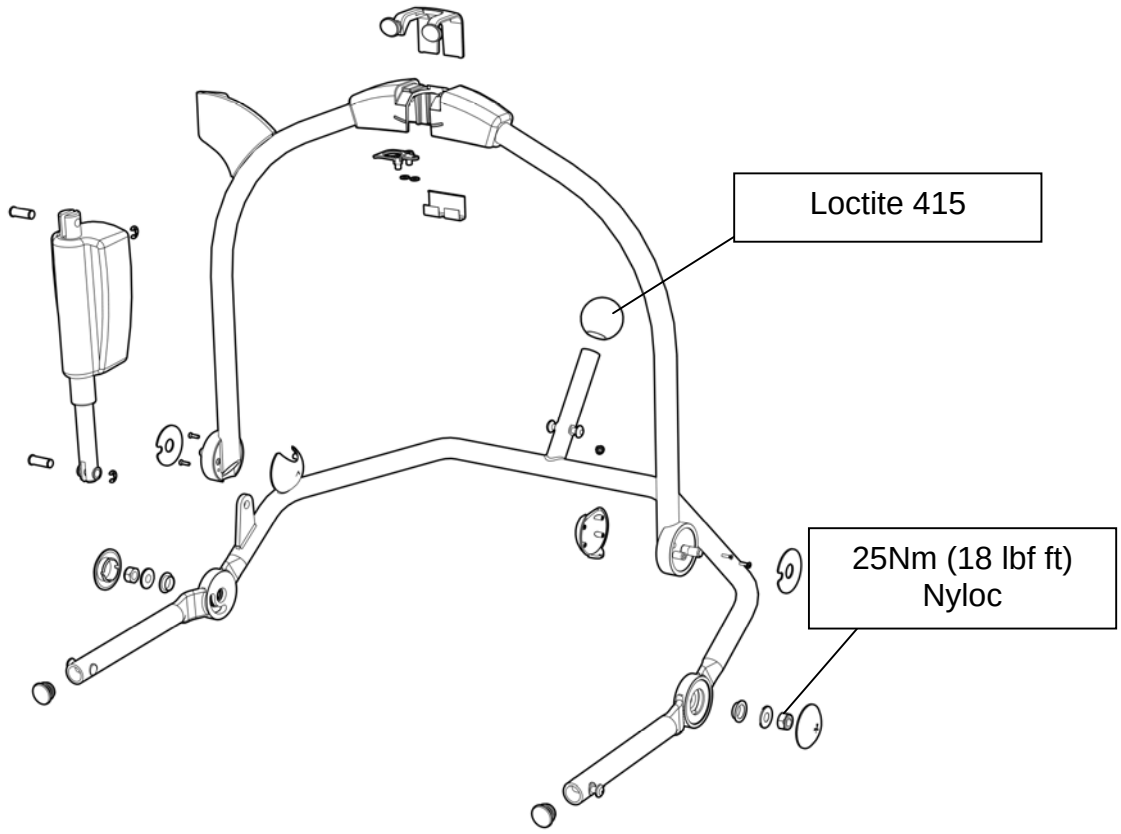
Thread retaining: Apply Loctite 243 when no threadlocking patch has been pre-applied. When replacing a part with pre-applied threadlocking the part should be replaced by a new part using pre-applied threadlocking, castors are excepted.

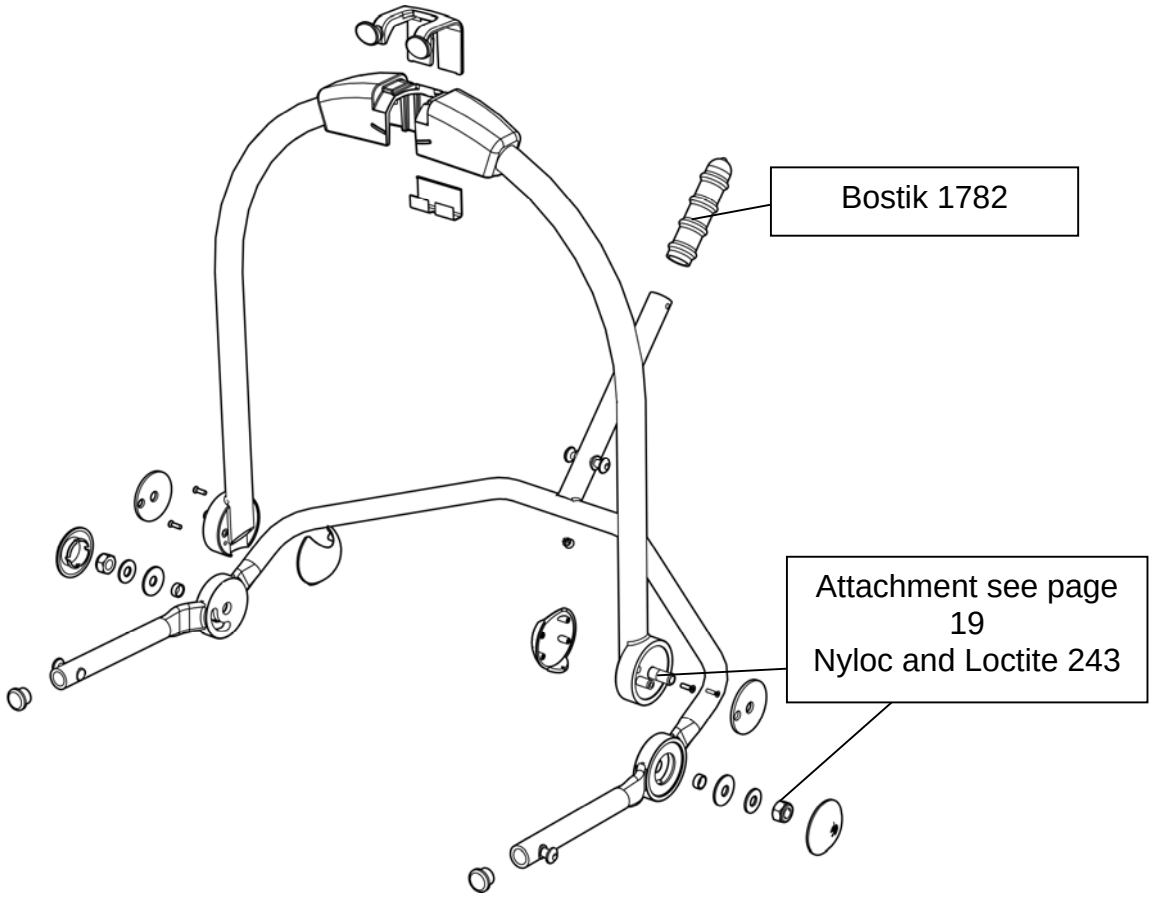


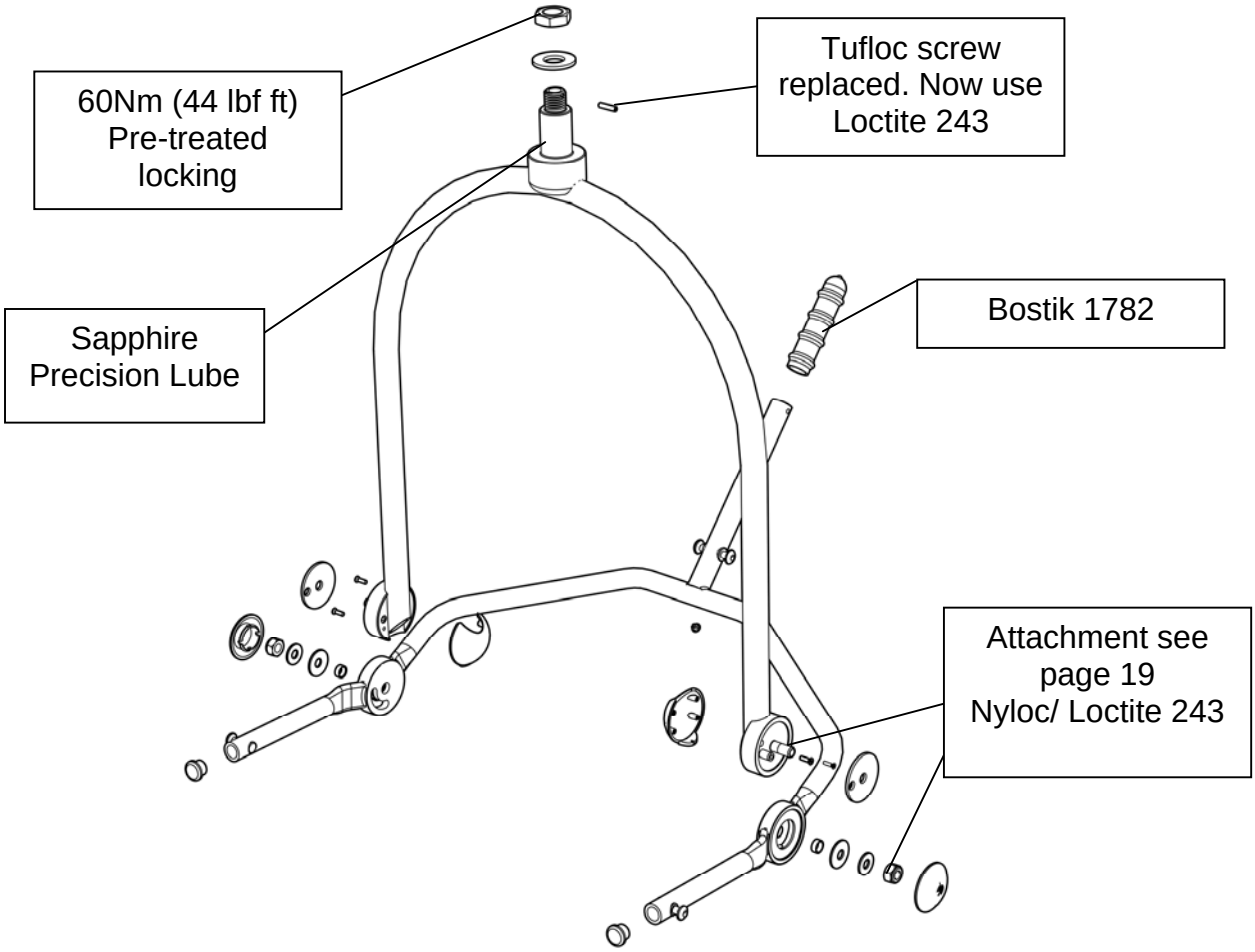

20Nm (14,8 lbf ft)
Loctite 243
Engrease
L21M/Lenson/Castrol
Loctite 638
Engrease
L21M/Castrol
8,7Nm (6,4 lbf ft)
Loctite 243
Lenson White
Grease
Shell Cassida
Statoil Uniway
Lix 62
8,7Nm (6,4 lbf ft)
Loctite 243
Lenson White
Grease
Shell Cassida
Inside mast

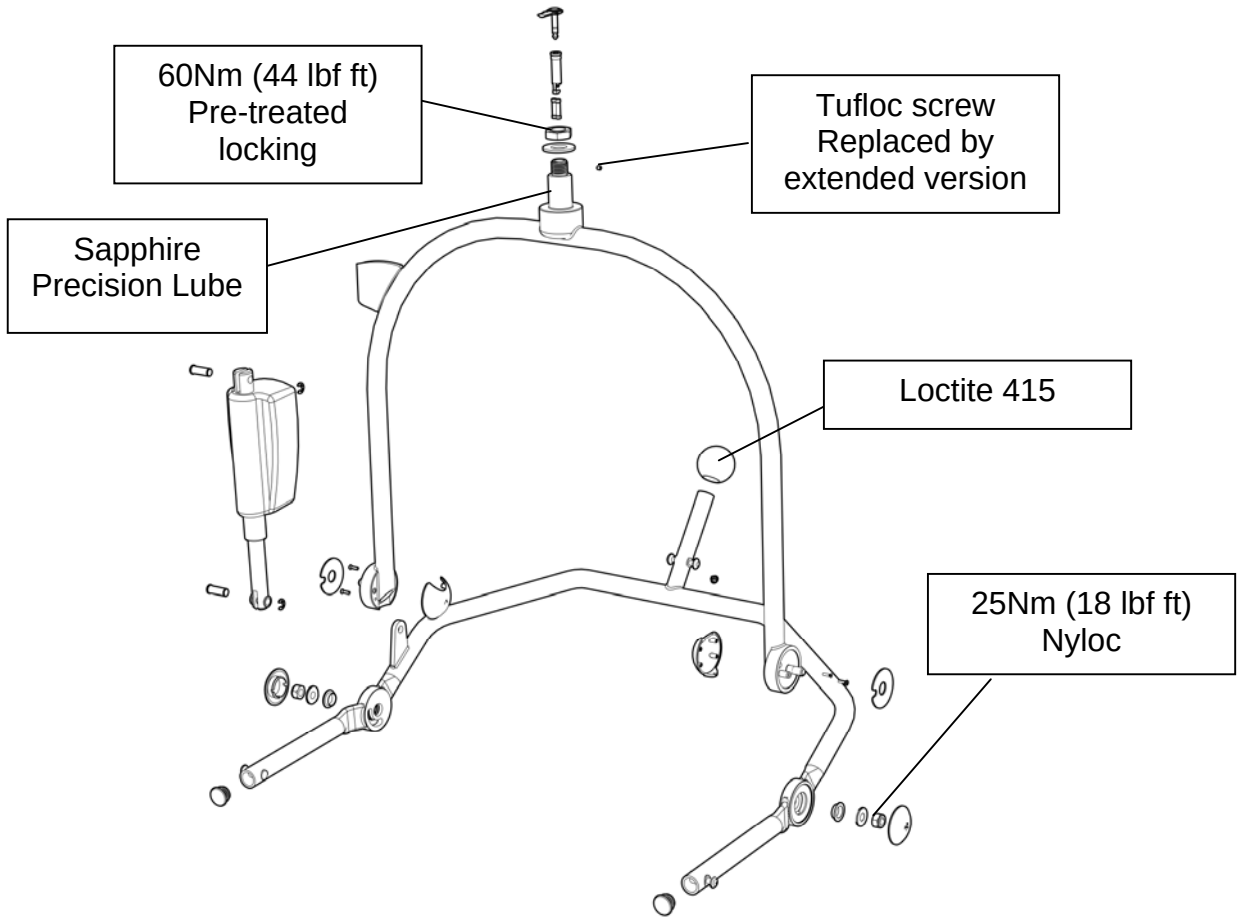

Silicone
Loctite Superflex
595
Lenson White
Grease
5 Nm (3,7 lbf ft)
Loctite 243
Loctite 415
Loctite 454


Scale
72Nm (52 lbf ft)
Loctite 243
60Nm (44 lbf ft)
Pre-treated
locking
Loctite 243
Engrease
L21M/Castrol/vaselin
Tufloc screw
Replaced by
extended
version
Sapphire
Precision Lube
Loctite 243
Engrease
L21M/Castrol/
vaselin
25Nm (18 lbf ft)
Locking bolt
60Nm (44 lbf ft)
Loctite 243


Loctite 415
25Nm (18 lbf ft)
Nyloc


Bostik 1782
Attachment see page 19
Nyloc and Loctite 243


60Nm (44 lbf ft)
Pre-treated
locking
Tufloc screw
replaced. Now use
Loctite 243
Sapphire
Precision Lube
Bostik 1782
Attachment see
page 19
Nyloc/ Loctite 243


60Nm (44 lbf ft)
Pre-treated
locking
Tufloc screw
Replaced by
extended version
Sapphire
Precision Lube
Loctite 415
25Nm (18 lbf ft)
Nyloc

12 Monthly Service Procedure

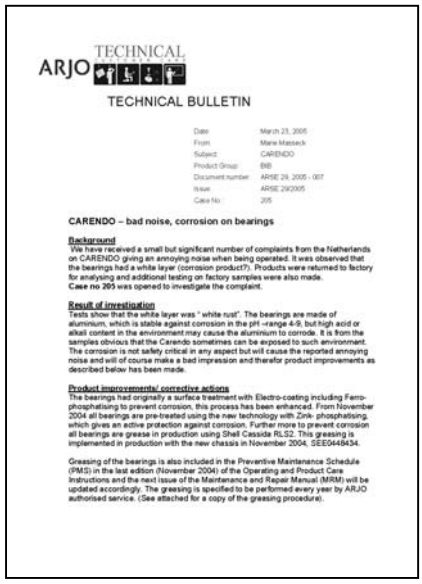
WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

- Visually check the general condition of all external parts.

- Check that the latest updates have been implemented:

  - Check if there are any *Field Correction Bulletins*, *Safety Notices* or *Technical Bulletins* that have been published since the last service. (These replaces the previously used *Technical Advice Notices* (TAN) with status A (Safety issue, requiring some form of recall) or B (Non safety issue).

  The check must be done to keep the product up to date according to safety and product improvements. Bulletins and Notices can be generated as a result of an engineering change note, a safety incident report or a change to form/fit etc.



ARJO TECHNICAL

TECHNICAL BULLETIN

Date March 23, 2005
From Marie Masseck
Subject CARENDO
Product Group BIB
Document number ARSE 29. 2005 - 007
Issue ARSE 29/2005
Case No 205

CARENDO – bad noise, corrosion on bearings

Background
We have received a small but significant number of complaints from the Netherlands on CARENDO giving an annoying noise when being operated. It was observed that the bearings had a white layer (corrosion product?). Products were returned to factory for analysing and additional testing on factory samples were also made.
Case no 205 was opened to investigate the complaint.

Result of investigation
Tests show that the white layer was " white rust". The bearings are made of aluminium, which is stable against corrosion in the pH –range 4-9, but high acid or alkali content in the environment may cause the aluminium to corrode. It is from the samples obvious that the Carendo sometimes can be exposed to such environment. The corrosion is not safety critical in any aspect but will cause the reported annoying noise and will of course make a bad impression and therefor product improvements as described below has been made.

Product improvements/ corrective actions
The bearings had originally a surface treatment with Electro-coating including Ferro-phosphatising to prevent corrosion, this process has been enhanced. From November 2004 all bearings are pre-treated using the new technology with Zink- phosphatising, which gives an active protection against corrosion. Further more to prevent corrosion all bearings are grease in production using Shell Cassida RLS2. This greasing is implemented in production with the new chassis in November 2004, SEE0448434.

Greasing of the bearings is also included in the Preventive Maintenance Schedule (PMS) in the last edition (November 2004) of the Operating and Product Care Instructions and the next issue of the Maintenance and Repair Manual (MRM) will be updated accordingly. The greasing is specified to be performed every year by ARJO authorised service. (See attached for a copy of the greasing procedure).

- Check the serial number of the hoist this is located on the mast console behind the 24V battery: refer to bar-code label.

- Check that all labels are legible replace as necessary.

- Check that the operating controls on the handset function correctly. If necessary recommend replacement.

- Check that the operating controls on the keypad mounted on the console function correctly at all limits.

- Operate the emergency lowering switch, the hoist must lower.

- Push in the ‘STOP’ button. When pressed in, all power functions should be inoperative. Press the ‘ON’ button to reset.

- With the hoist jib positioned at approximately its mid lifting height:

  - Using the handset, lower the hoist jib.
  - Keeping the handset button depressed use your other hand to restrain the weight of the jib.
  - The motor will stop while the jib remains restrained by your hand, release the button on the handset.
  - Remove your restraint of the jib.
  - The jib **must** remain in its previously restrained position.

- Repeat using the mast keypad.

NOTE: The lift actuator has a recommended number of 40,000 lift cycles or 440 hours of use before replacement. One lifting cycle equals raising then lowering the patient.

- Operate the raise/lower function of the hoist through its full operating range and listen for any abnormal noise from the actuator. If the actuator is noisy recommend replacement of the actuator.

- If a powered DPS system is fitted check the operation of the system using the handset and the mast key pad making sure that the operation is smooth and precise.

- Check the emergency lowering facility as follows:

Electrical

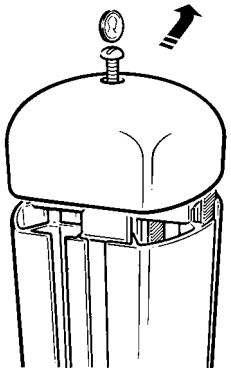
- With the jib raised to approximately its mid lifting height:
    - Press and hold the emergency lowering switch. The jib **must** lower.
    - Whilst the jib lowers use your hand to restrain the jib. The motor **must** stop.
    - Release the emergency lowering switch.

Mechanical

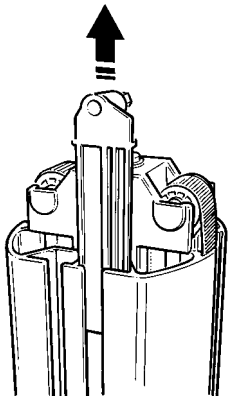
- With the jib raised to approximately its mid lifting height:
    - Remove the battery from the hoist.
    - Remove the top cover from the mast.
    - Using the Wind Down Tool provided **loosen** the M12 cap screw approximately four full turns enough to allow the actuator to rotate freely: refer to Figure below.
    - Insert the Wind Down Tool provided into the top of the actuator and turn in a clockwise motion to wind down the actuator and jib. The jib must lower freely.
    - Align the black line on the actuator with the black line on the outer mast and using the Wind Down Tool provided tighten the M12 cap screw, this is a hand tight fit and must not be over tightened.

Location and Use of Wind Down Tool

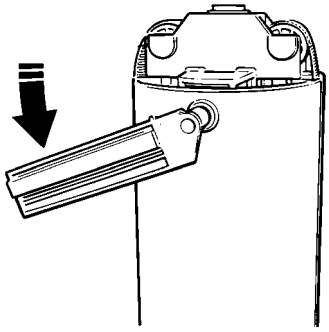
Step 1



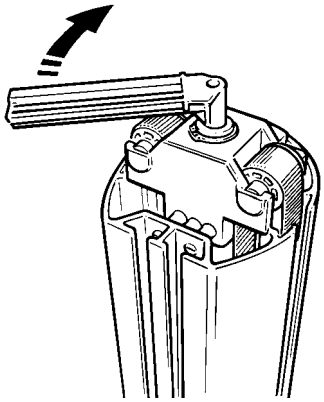
Step 2



Step 3



Step 4



- Raise the lift arm and visually examine the two lifting bands for any signs of wear or damage making sure that the starlock washers are installed. Replace if necessary.

    NOTE: If the starlock washer is not fitted make sure that it has not fallen inside the mast.

- Install the mast top cover and battery.
- Check the castors for damage, deterioration and freedom of operation. Check the effectiveness of the braked castors.
- Visually check the battery indicator and make a note of the hours of powered movement on the service paperwork.
- If a scale unit is installed to the hoist check the accuracy using the 2 x 20kg weights (ST219). If recalibration is necessary it must be performed and verified by an approved organisation and signed off in the logbook.

Jib and Attachments

(Torques and consumable material according to page 10-15).

WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

Refer to Figure below:

1.Remove the jib top cover and use a 30mm Socket to check the torque on the M20 locknut that retains the lift support/teebar to the jib.

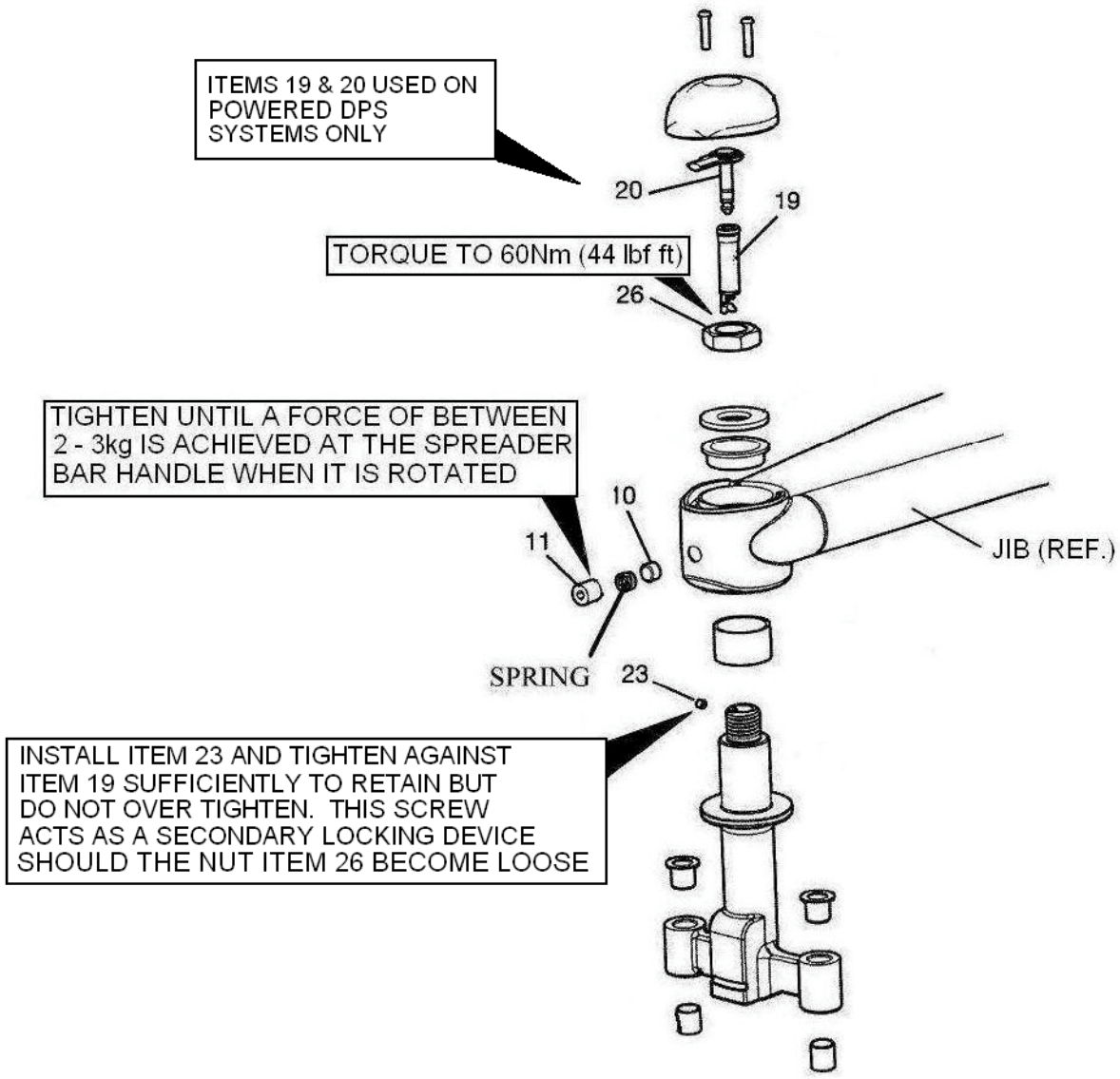
2. Make sure that the M4 screw item 23 is installed to the lift support/teebar.

3.Check that a force of between 2 – 3 kg is required to rotate the spreader bar in either direction. -Adjust item 11 if required to achieve the correct force use Loctite on the threads if adjustment is required in accordance with Section 5.5.

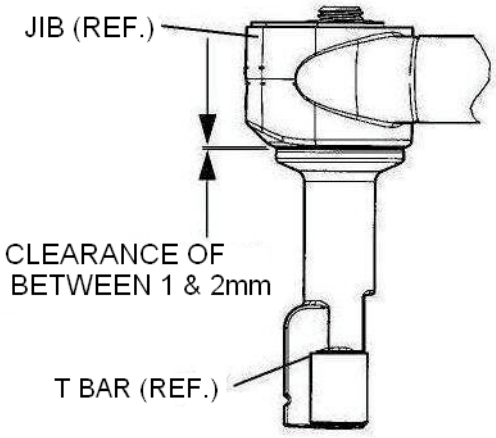
- If a powered DPS is installed visually check the condition of the jackplug (item 20), socket (item 19) and attached cables.
- Visually check the condition of the jib top cover if cracked or damaged recommend replacement. Install the jib top cover.
- When rotating the spreader bar listen for any abnormal noise such as rubbing this would indicate that the assembly requires lubrication. If necessary lightly lubricate the spindle area.

NOTE: If fitted with a 2 point spreader bar attach the Load Cell to the lift hook.

T Bar (Combi) and Lift Support (Dedicated) Retention to Jib


ITEMS 19 & 20 USED ON POWERED DPS SYSTEMS ONLY
20
19
TORQUE TO 60Nm (44 lbf ft)
26
TIGHTEN UNTIL A FORCE OF BETWEEN 2 - 3kg IS ACHIEVED AT THE SPREADER BAR HANDLE WHEN IT IS ROTATED
10
11
JIB (REF.)
SPRING
23
INSTALL ITEM 23 AND TIGHTEN AGAINST ITEM 19 SUFFICIENTLY TO RETAIN BUT DO NOT OVER TIGHTEN. THIS SCREW ACTS AS A SECONDARY LOCKING DEVICE SHOULD THE NUT ITEM 26 BECOME LOOSE

T Bar to Jib



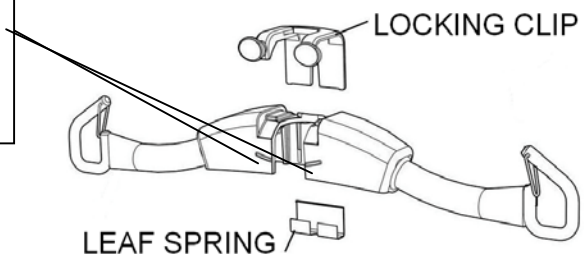
- Refer to Figure above. Check the clearance between the jib and the T bar this should be between 1 and 2mm and can only be altered by replacing the bushes there is no other adjustment.

  NOTE: The clearance of between 1 and 2mm is also applicable to the dedicated lift support.

- Visually check the jib for damage and defects to the paintwork and the welded joints. Make sure that the end plugs are installed: recommend replacement of any defective parts.

  - If fitted with a combi system (see picture below) operate the locking clip and remove the attachment from the T bar.

Check the welding of the two steering pins. If loose replace the hanger bar!

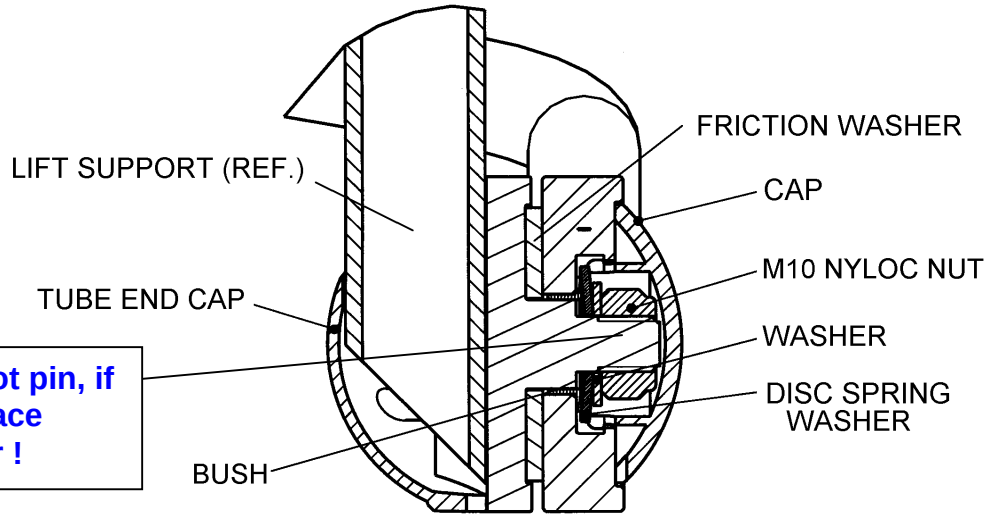


NOTE: The combi attachments are optional therefore it is possible that not all will be with each hoist. Make a note on the Service/Repair Paperwork of all attachments checked.

- Visually check the condition of the following combi attachments paintwork, welds, hooks, locking clip, steering pins and sling retaining clips: recommend replacement of any damaged or defective parts.
  - Walking Jacket Small (2 Hook)
  - Loop Small (2 Hook)
  - Loop Medium (2 Hook)
  - Loop Large (4 Hook)
  - 4 Point DPS
  - 4 Point Powered DPS

  Stretcher: make sure that the operation of the locking bolt is smooth and precise and when in the locked position you are not able to fold the stretcher: refer to Page 13.

Four Point DPS Pivot Point



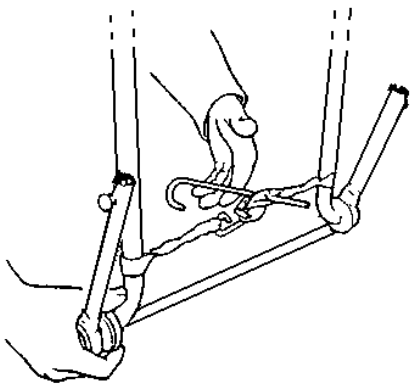
Check pivot pin, if loose replace hanger bar !

- Visually check the condition of the four igus bushes in the T bar: replace if necessary.

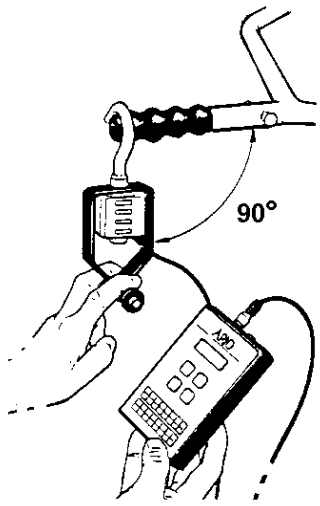
Four Point DPS (Combi and Dedicated)

- Visually check the welds around the lifting lugs for cracks or any sign of deterioration.
- Check the condition of the handgrip recommend replacement if necessary. Secure the new handgrip in accordance with the manufacturers instructions.
- Refer to Figure above. Remove the two caps, two M10 nyloc nuts, two washers and two disc spring washers.
- Refer to Figure *Special Tool ST252* below. Use the Special Tool , wind the legs inwards and lift the frame over the studs.
- Refer to Figure above. Visually check the condition of the two friction washers and replace with new if cracked or contaminated.
- Refer to Figure above. Re-assemble the lift frame to the lift support as shown use Loctite on the studs of the lift support before installing the two M10 nyloc nuts.
- Tighten one of the M10 nyloc nuts initially to 2.72kg (6 lbs) load and check using the Load Cell: refer to Figure *Load Cell* below. Tighten the remaining M10 nyloc nut until a total load of 5.44kg (12 lbs) is indicated on the Load Cell .

Special Tool ST252



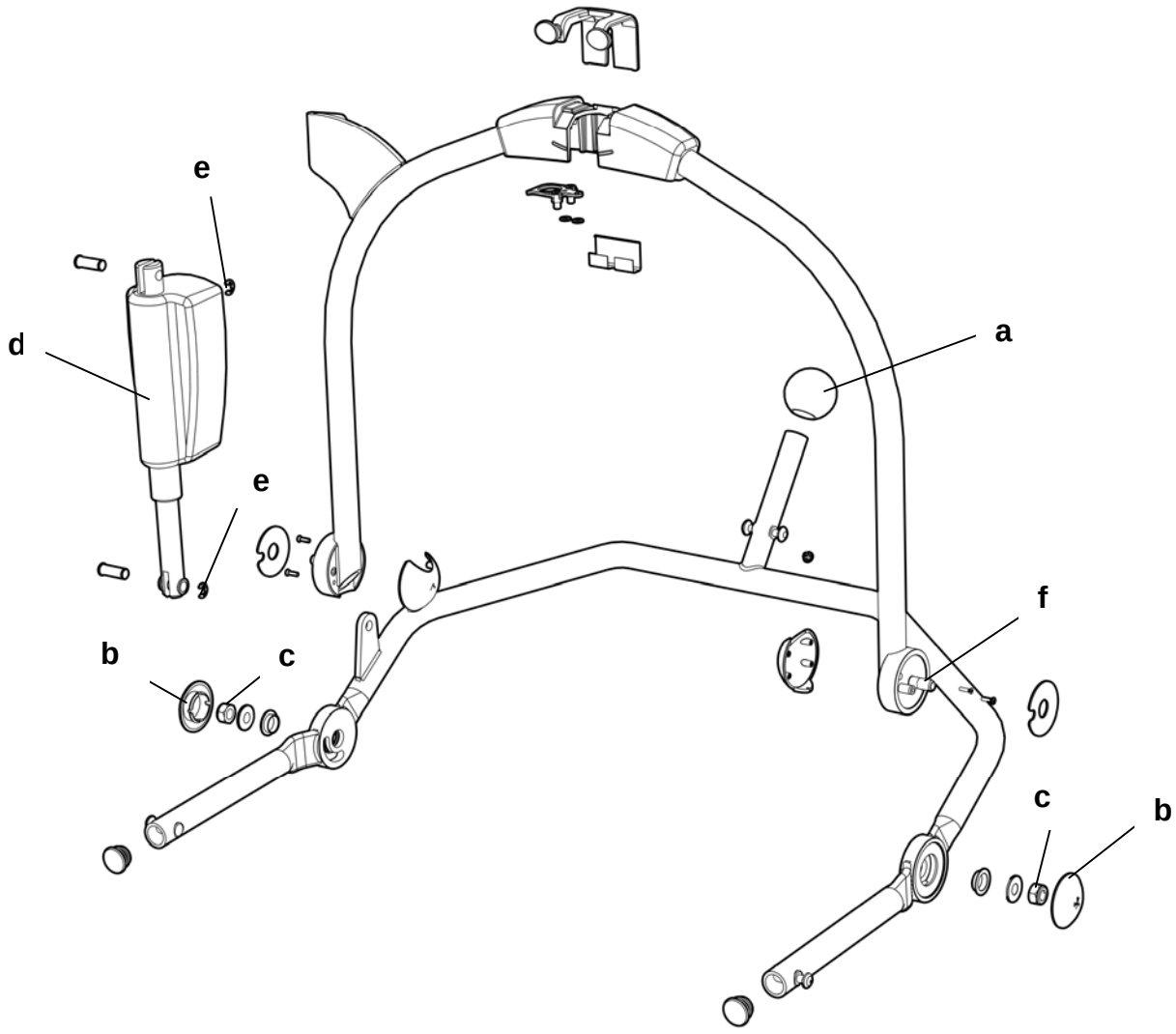
Load Cell



Four Point Powered DPS (Combi illustrated)

NOTE: The powered DPS pivot point configuration is the same as the non powered with the exception of a powered actuator and the friction washers being manufactured from nylon.

- Check the condition of the handgrip knob (**a**) recommend replacement if necessary. Secure the new handgrip knob in accordance with the manufacturers instructions.
- Remove the two caps (**b**) from the pivot points and use a 17mm Socket to check the torque on the two M10 nyloc nuts (**c**).
- Replace the two caps (**b**).
- (**Combi)** Visually check the condition of the T bar electrical contacts (see **e** on next side) look for signs of corrosion or wear. Clean or replace as necessary.
- Visually check the condition of the actuator (**d**) look for any signs of damage to the piston rod and the casing: if necessary recommend replacement.
- Check that the top and bottom 'E' clips (**e**) are installed these are used to retain the actuator to the lift frame and spreader bar.
- Visually check the welds around the lifting lugs for cracks or any sign of deterioration. Check the two pivot pins by hand for movement or unwinding (**f**)



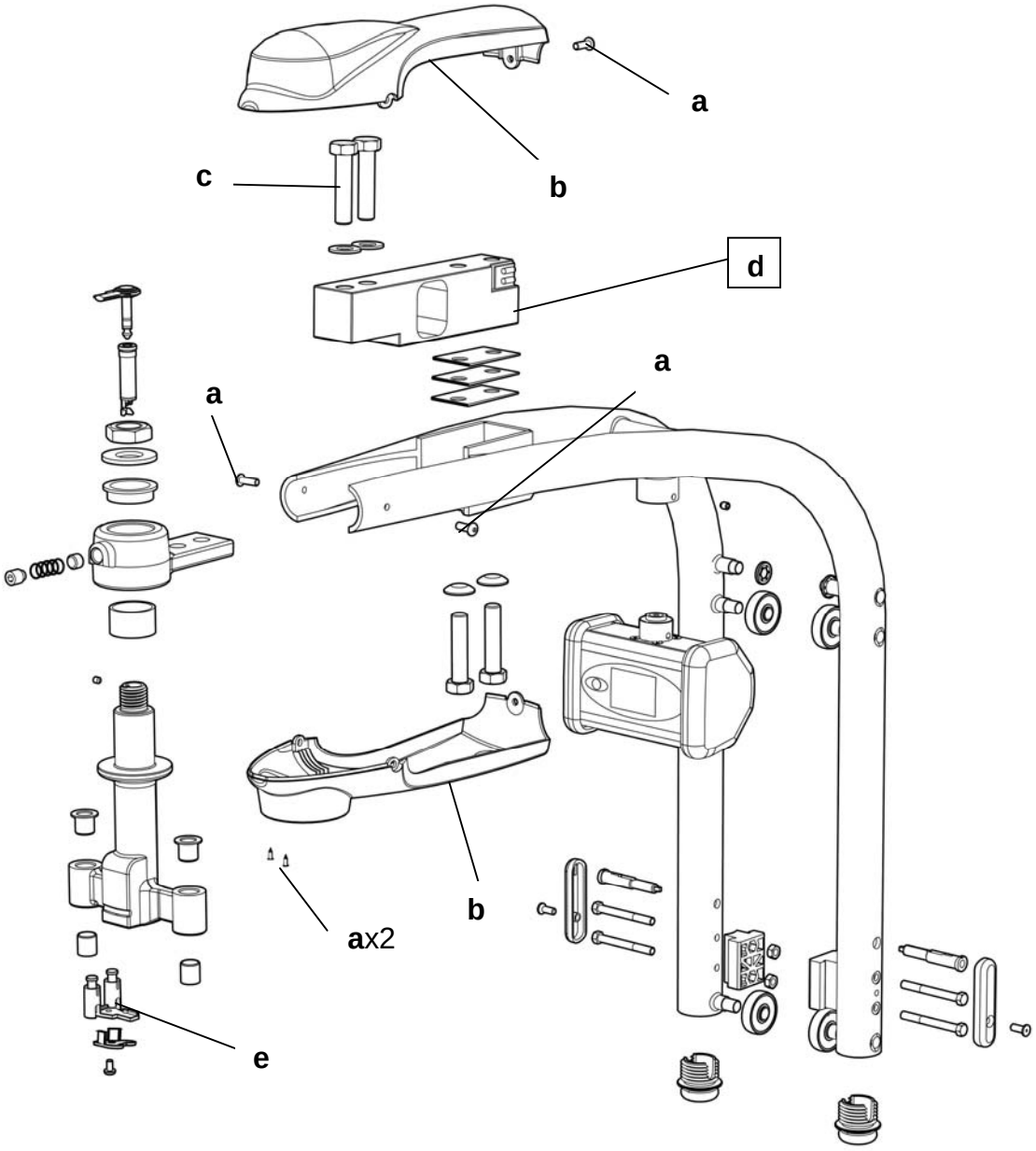
Jib with Scale Fitted (Combi illustrated)

- Use a 4mm Allen Key to remove the three (later models five) screws (**a**) that retain the scale top and bottom covers (**b**). Remove the top cover.

NOTE: If any adjustment of the load cell screws (**c**) is necessary a recalibration process performed and verified by an approved organisation will be required. This will then have to be signed off in the logbook.

- Visually check the security of the four load cell screws (**c**) that retain the load cell (**d**) to the jib. If the security of the screws is suspect check the torque of the screws. Any movement of the screws will necessitate removal of the screws and re-installation using Loctite on the threads and a recalibration process: refer to NOTE.

- If satisfied with the security of the load cell screws re-install the cover (**b**) and retain with the three M5 button head screws (**a**).



Mast Assembly and Push Handle

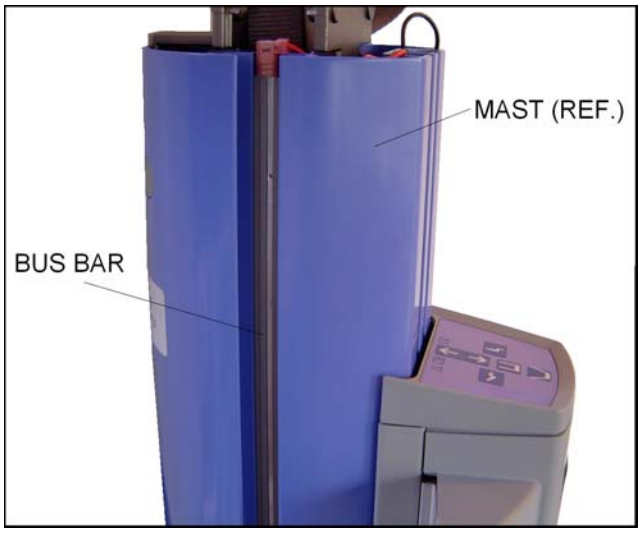
(Torques and consumable material according to page 10-15).

WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

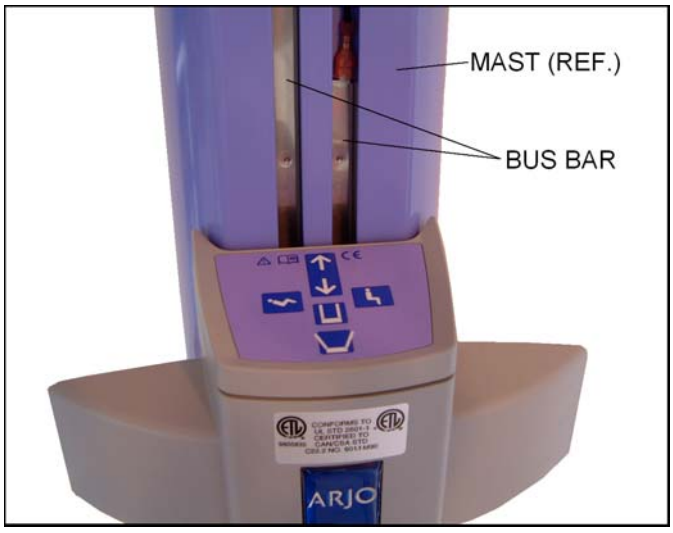
NOTE: The lift band assemblies are replaced at 24 monthly service intervals.

- Refer to Figures below. If the hoist is fitted with a powered DPS visually check the condition of the bus bars that are located in the outer mast in the rear and side channels. Look for signs of wear, damage or contamination: if necessary recommend replacement.

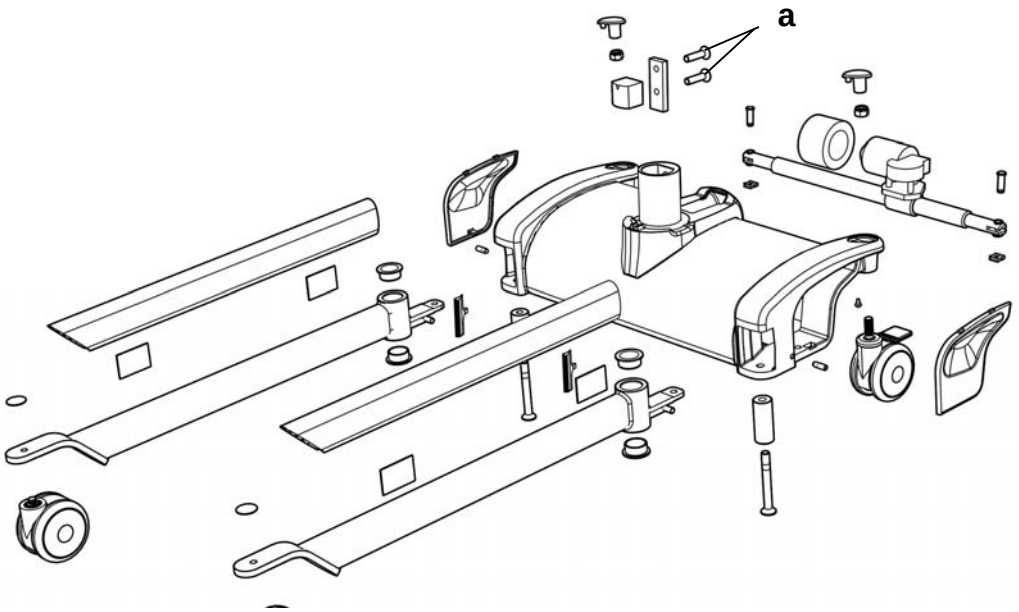
Bus Bar (Side Channel x 1 each side)



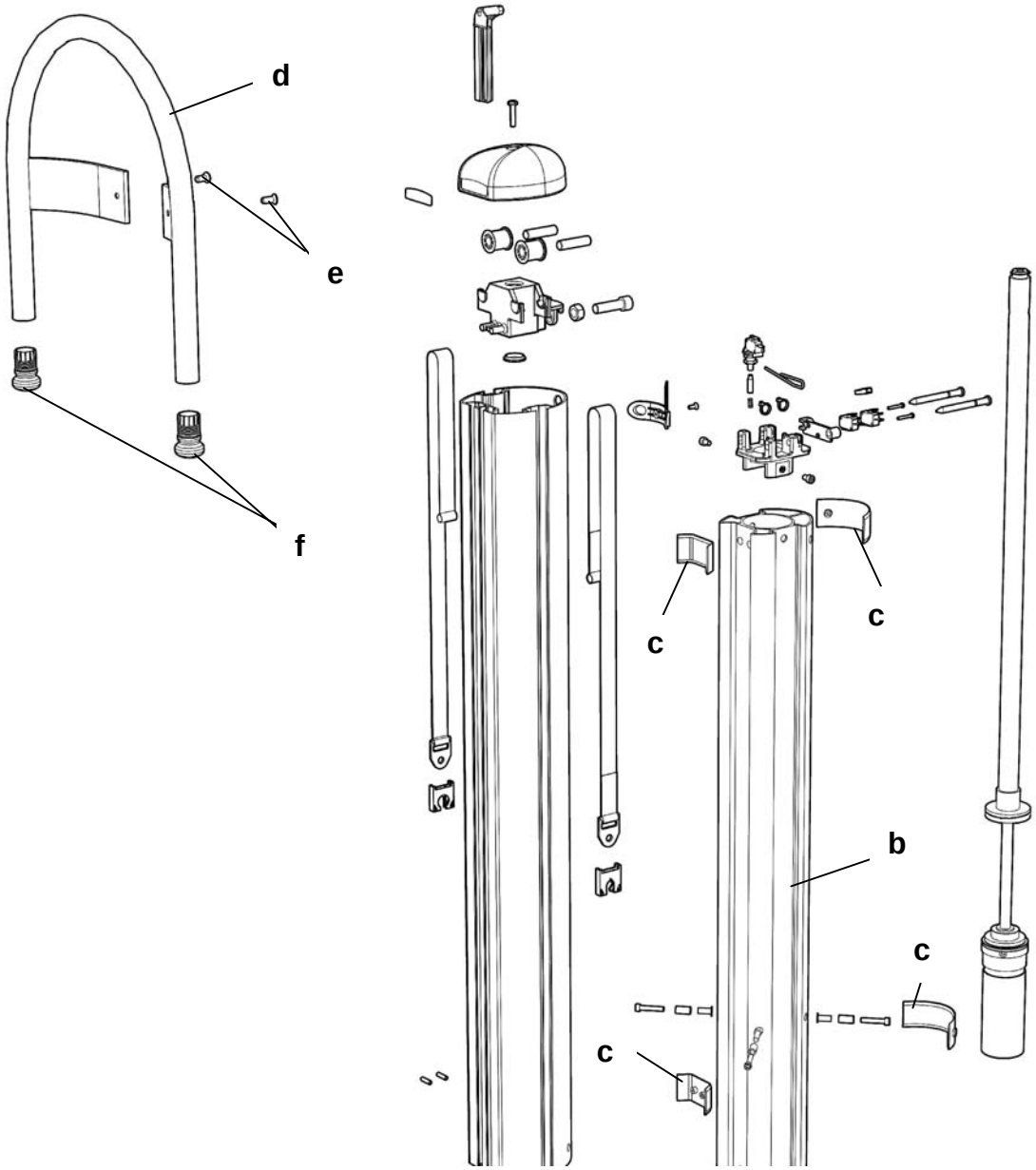
Bus Bar (Rear Channel)



- Using a 6mm Socket Allen Key check the torque of the two M10 countersunk mast to chassis bolts (**a**). If loose the M10 countersunk bolts must be removed and replaced using Loctite.



- Visually check the condition of the inner mast (**b**) look for signs of scuffing on the paintwork this would be an indication of worn upper and lower mast bearings (**c**). If scuffing is evident replace the upper and lower mast bearings.

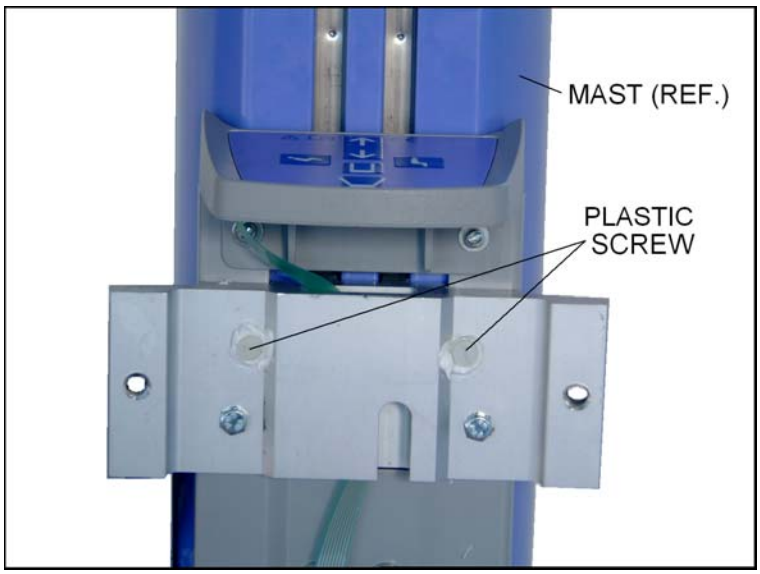


- Visually check the push handle (**d**) paintwork and welds for defects: if necessary recommend replacement.

- Use a 5mm Socket Allen Key to check the security of the two countersunk screws (**e**) that retain the push handle to the mast guide block.

  Make sure that the end plugs (**f**) are installed to the push handle. Replace if necessary.

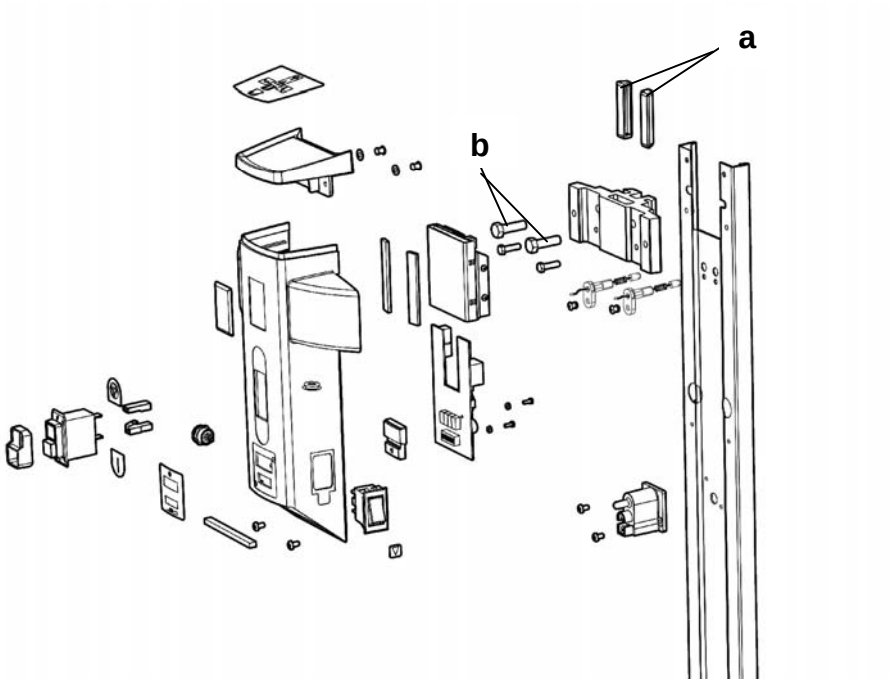
Push Handle Adjustment Plastic Screws



CAUTION: DO NOT LEAVE THE PLASTIC SCREWS FULLY TIGHTENED AGAINST THE MAST WHEN ADJUSTING THE PUSH HANDLE. THIS WILLNOT ALLOW A SMOOTH OPERATION WHEN RAISING/ LOWERING THE MAST.

- Visually check the condition of the slipper mouldings (**a**). Replace if worn or damaged.

NOTE: A visual indication of worn slipper mouldings would be movement between the console and mast when pressure was applied to the push handle. Alternatively the two plastic screws (**b**) housed within the console cover plate could be loose. These are set in silicone sealant and should be tightened to bottom out and then turned back a quarter turn. If tightening is necessary the silicone sealant must be renewed.



Chassis Assembly

(Torques and consumable material according to page 10-15).

WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

- Visually check the integrity of all welds and paintwork for defects.

- Visually check the condition of the plastic leg extrusions (**a**) if damaged recommend replacement.

- Remove the battery and protect the push handle as necessary and carefully position the hoist on its back.

On both legs:

- Using a small screwdriver inserted through the chassis base, depress the retaining lug of the end cap (**b**). Remove the end cap.

- Visually check that the clevis pin (**c**) and safety fastener (**d**) are installed to the actuator (**e**). Replace if necessary.

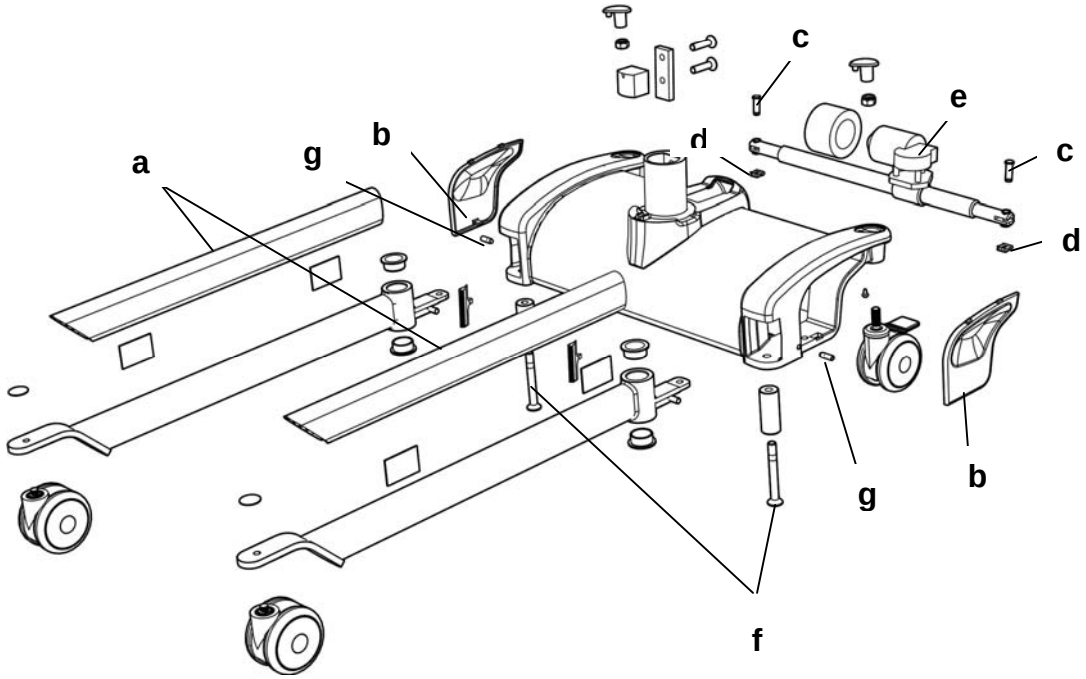
- Install the end cap (**b**). **NOTE:** To ease installation of the end cap insert the bottom-retaining lug into the slot and slide the end cap into position.

- Using a 8mm Socket Allen Key check the torque on M12 countersunk set screw (**f**). If loose the M12 countersunk set screw must be removed and replaced using Loctite.

- Make sure the legs are square to the chassis cross member. The dimension across the centres of the legs should be between 588 and 592mm. If adjustment is necessary using a 4mm Allen Key remove and replace the M8 socket set screw (**g**) using Loctite .

- Using a 8mm Socket Allen Key check the torque on the braked and unbraked castors. If loose the castor must be removed and replaced using Loctite.

- Carefully position the hoist upright.



Sling Checks

- Visually check all slings presented with the hoist:
  - Visually check the stitching, seams and the fabric must be in good condition.
  - Visually check the condition of all plastic support clips, look for cracks on the cold shut line and any deformation that would be attributed to incorrect laundry processes.
  - The procedure detailed in the text that follows only applies to the plastic clips on ARJO manufactured slings.

Fig. 13. Sling Clip Gauge ST331 Band SIDC2000

  - Refer to the above illustration and insert the machined diameter of the Sling Clip Gauge ST331 into the large diameter of the keyhole slot in the plastic clip.
  - Allow the weight of the gauge to rest against the sling clip and attempt to pass the gauge pin through the slot into the smaller diameter. Do not force the gauge through the slot.
  - The gauge must not pass through the narrow (mouth) section of the plastic sling clip. If the gauge does pass through the slot the sling clip is defective:
    - Attach one of the “DEFECTIVE - DO NOT USE” bands , *Part No. SIDC2000*, securely to the sling. Sign and date the band with a indelible marker pen. (**NOTE *This is a UK band. It can be ordered outside UK as an example and should to be changed to a country specific layout***)
    - Record the identity serial number from the DO NOT USE band on your service report sheet and make a note of the failure.
    - Use the indelible marker pen to discreetly write the identity serial number from the DO NOT USE band in a corner of the sling.
    - Inform the customer of your findings and the actions taken and advise that the sling be withdrawn from service and replaced with a new or serviceable sling.

      NOTE: The use of this gauge is the only approved method of checking the serviceability of the ARJO plastic sling clip and no other method should be used.
  - Check that the Safe Working Load (SWL) label is legible if necessary mark the SWL with an indelible marker pen.
  - If in doubt about the condition of the sling recommend that the sling should be removed from service.
  - If satisfied with the condition of the sling identify in accordance with one of the following:
    - Slings that have a serial number label should be signed and dated with an indelible pen and the information recorded on the Service Report paperwork.

    OR
    - Slings without a serial number label mark the date and Engineers number discreetly in a corner of the sling with an indelible marker pen.

Load Test (local requirement)

WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

1. Medium Powered and Non Powered Dynamic Positioning System (DPS)

- Set up the ARJO Load Test Kit as shown and test to the Safe Working Load (SWL).
- Release the load and remove the load test equipment check the hoist for any permanent deformation or damage.

2. Loop Medium Two Hook and Walking Jacket Two Hook

- Set up the ARJO Load Test Kit as shown and test to Safe Working Load (SWL).
- Release the load and remove the load test equipment check the hoist for any permanent deformation or damage.

3. Loop Small Two Hook

- Set up the ARJO Load Test Kit as shown and test to Safe Working Load (SWL).
- Release the load and remove the load test equipment check the hoist for any permanent deformation or damage.

4. Loop Large Four Hook

- Set up the ARJO Load Test Kit as shown and test to Safe Working Load (SWL).
- Release the load and remove the load test equipment check the hoist for any permanent deformation or damage.

5. Large Powered and Non Powered Dynamic Positioning System (DPS)

- Set up the ARJO Load Test Kit as shown and test to Safe Working Load (SWL).
- Release the load and remove the load test equipment check the hoist for any permanent deformation or damage.

6. Combi Stretcher Frame and Strap Stretcher

- Set up the ARJO Load Test Kit as shown and fill the 6 x 25 Litre water containers (part of ST120) with water and test to 160kg.

  NOTE: The six water containers filled with water equal the SWL of 160kg.
- Maintain the load for a period of 5 minutes during this period move the containers to ensure that all cross straps are tested.
- Remove the containers and visually check the strap stretcher and associated details for any signs of deterioration recommend replacement of any defective parts.
- Record condition and any recommendations on service paperwork and obtain customer signature.
- Affix the completed ARJO adhesive service label to the hoist and leave a copy of the paperwork including the load test certificate with the customer.

1. Medium Powered and Non-Powered DPS

Tool No.	Description	Qty
ST164	Handset and Load Cell	1
ST165	Load Test Strap (short)	2
ST171	Load Test Strap	2
ST239	Hinge Beam	1
ST240	Hook Bolt	1
ST243	Plunger Bracket	1

2. Loop Medium (illustrated) and Walking Jacket Two Hook (not illustrated)

Tool No.	Description	Qty
ST164	Handset and Load Cell	1
ST165	Load Test Strap (short)	2
ST166	Load Test Strap (long)	2
ST239	Hinge Beam	1
ST240	Hook Bolt	1
ST241	Load Cell Housing	1

3. Loop Small

Tool No.	Description	Qty
ST164	Handset and Load Cell	1
ST165	Load Test Strap (short)	2
ST239	Hinge Beam	1
ST240	Hook Bolt	1
ST241	Load Cell Housing	1

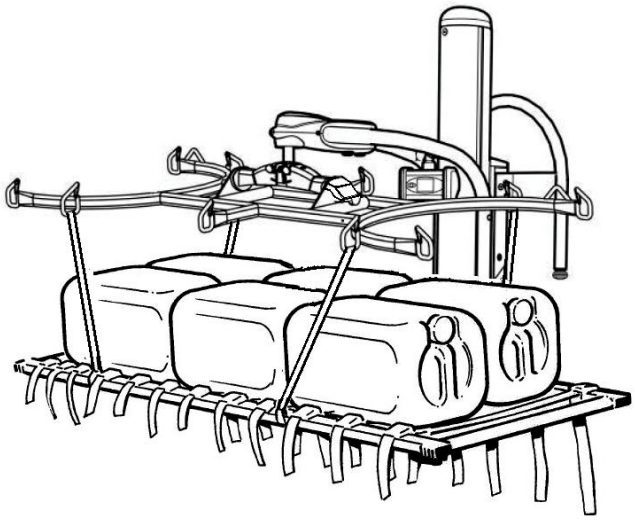
4. Loop Large Four Hook

Tool No.	Description	Qty
ST164	Handset and Load Cell	1
ST165	Load Test Strap (short)	2
ST166	Load Test Strap (long)	2
ST239	Hinge Beam	1
ST240	Hook Bolt	1
ST241	Load Cell Housing	1

5. Large Powered and Non-Powered DPS

Tool No.	Description	Qty
ST40	Load Frame & Straps	1
ST164	Handset and Load Cell	1
ST165	Load Test Strap (short)	2
ST239	Hinge Beam	1
ST240	Hook Bolt	1
ST241	Load Cell Housing	1

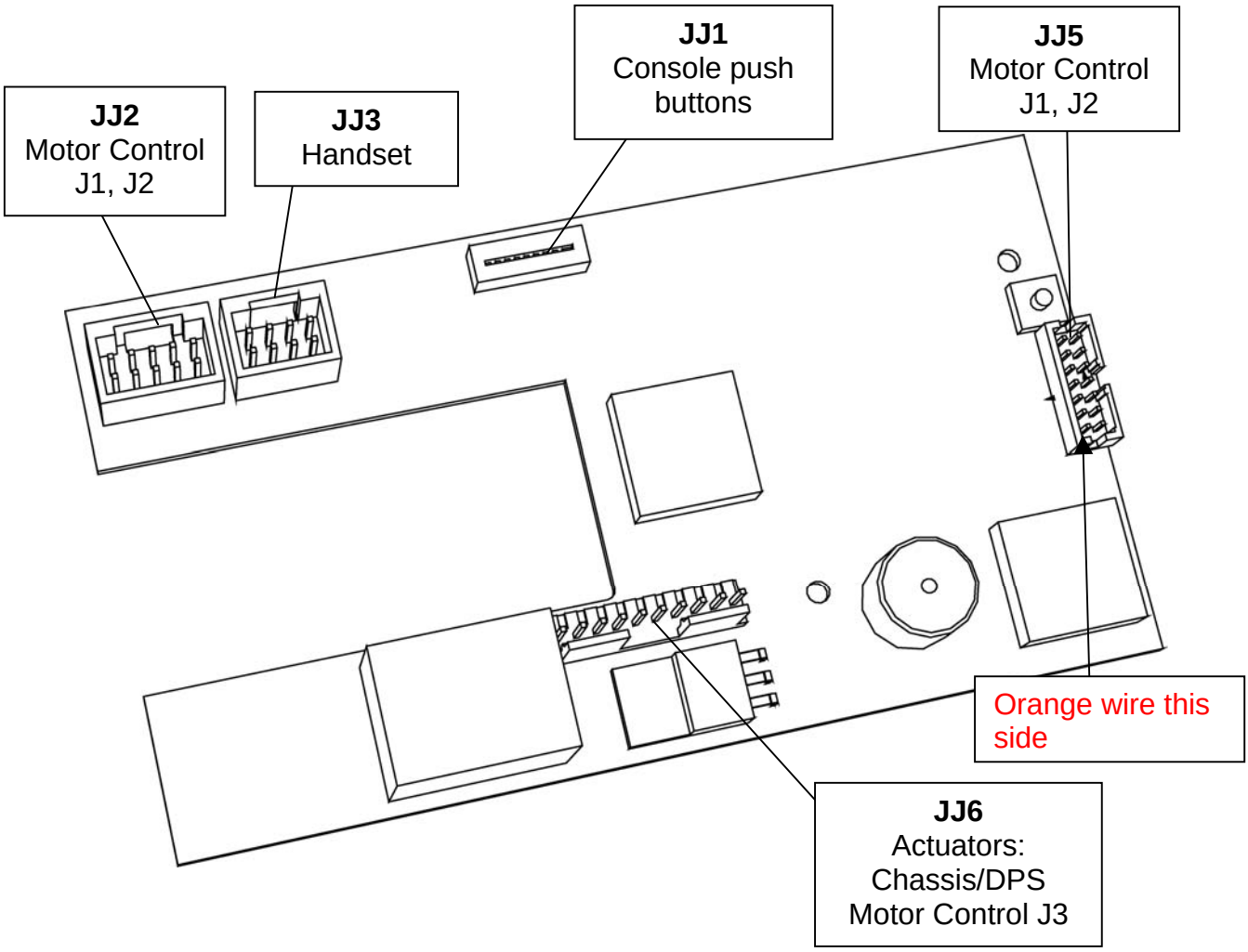
6. Combi Stretcher Frame and Strap Stretcher



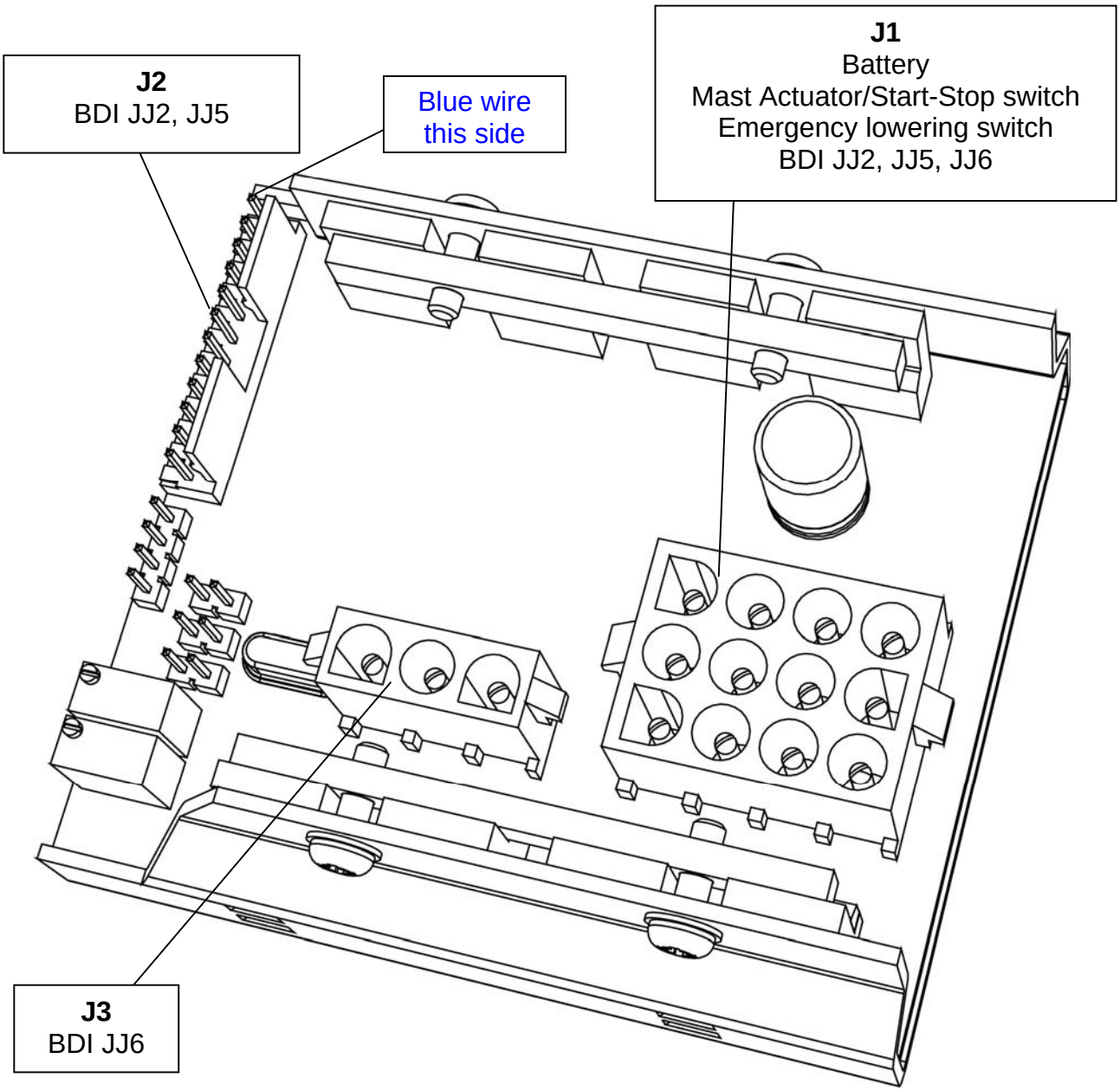
Tool No.	Description	Qty
ST120	Water Barrel	6

PCB:s and Wiring Diagram

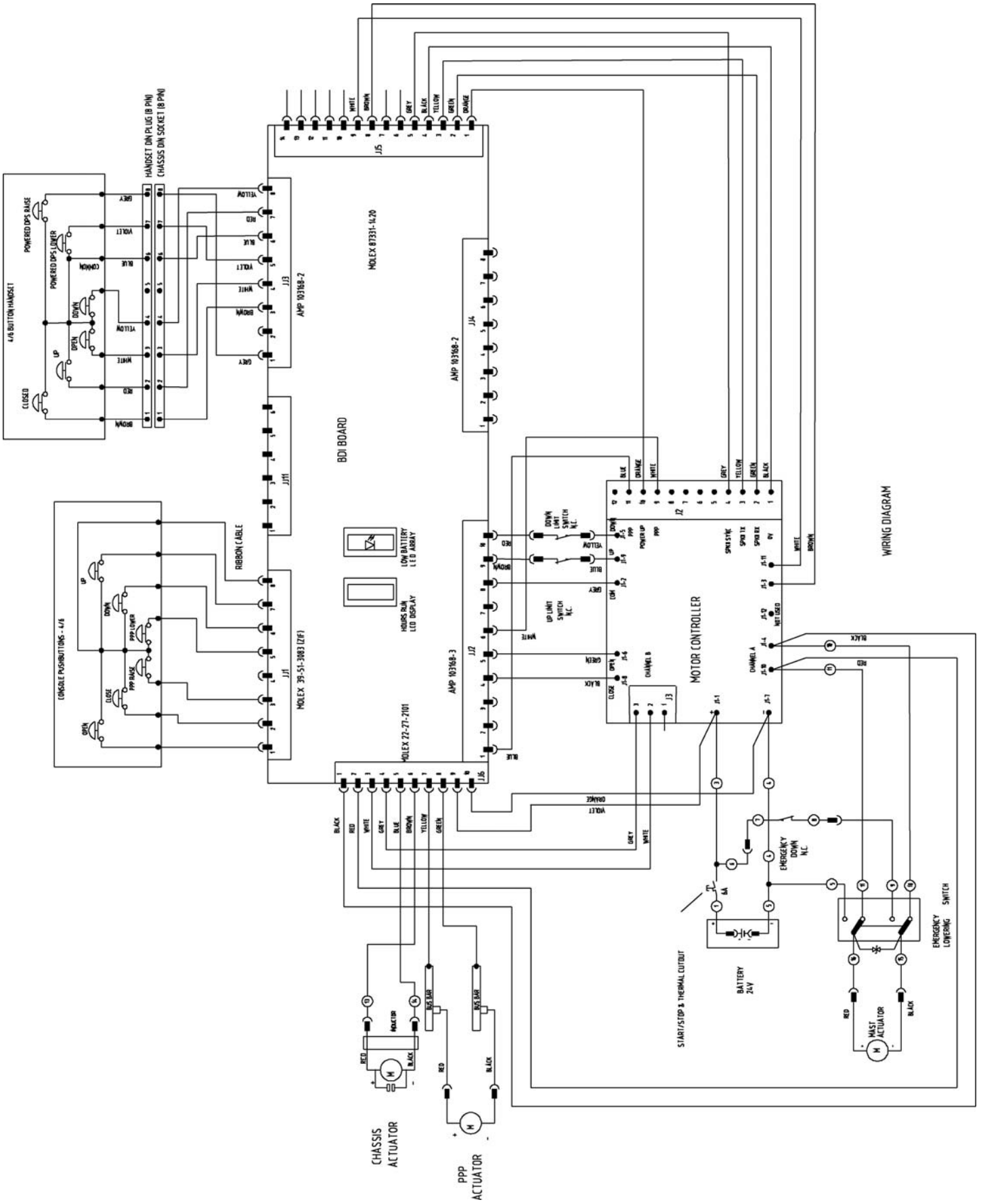
CAUTION: WEAR ELECTRO STATIC DISCHARGE (ESD) EQUIPMEMT WHEN HANDLING PRINTED CIRCUIT BOARDS (PCB'S).



PCB Battery Board (BDI)



PCB Motor Control



Wiring Diagram

24 Monthly Service Procedure

(Torques and consumable material according to page 10-15).

WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

Lift Band Removal and Replacement

- Position the hoist in a suitable work area that will allow enough room to remove the mast assembly from the chassis.

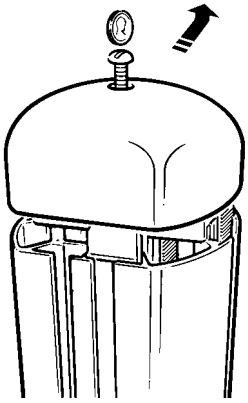
- Operate the handset or mast keypad to raise the lift arm to approximately its mid lifting height.

- Remove the battery and disconnect the handset.

- Remove the spreader bar.

- Remove the top cap from the mast: refer to Figure below.

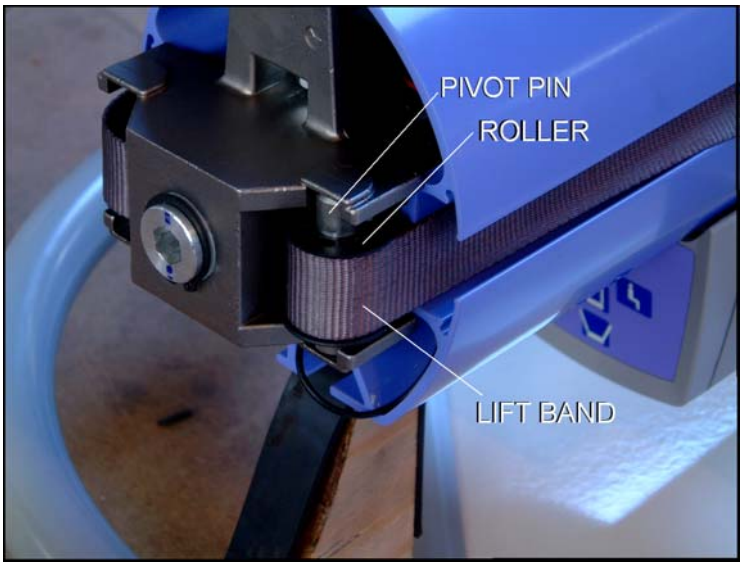
Top Cap (Mast)



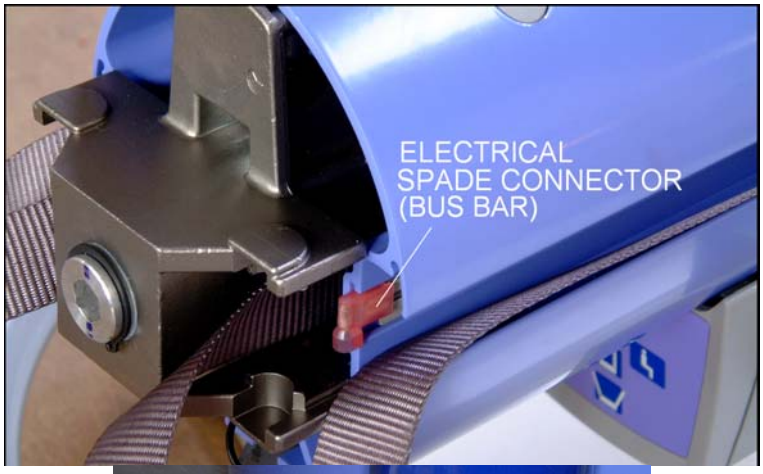
- Protect the push handle as necessary and carefully lay the hoist on the push handle.

NOTE: Laying the hoist in this position eases any weight restraint of the jib by the engineer while disconnecting the lift bands and associated details. However, if preferred the jib can be removed from the mast with the hoist in the upright position.

- Remove the pivot pin and roller from each side of the mast.



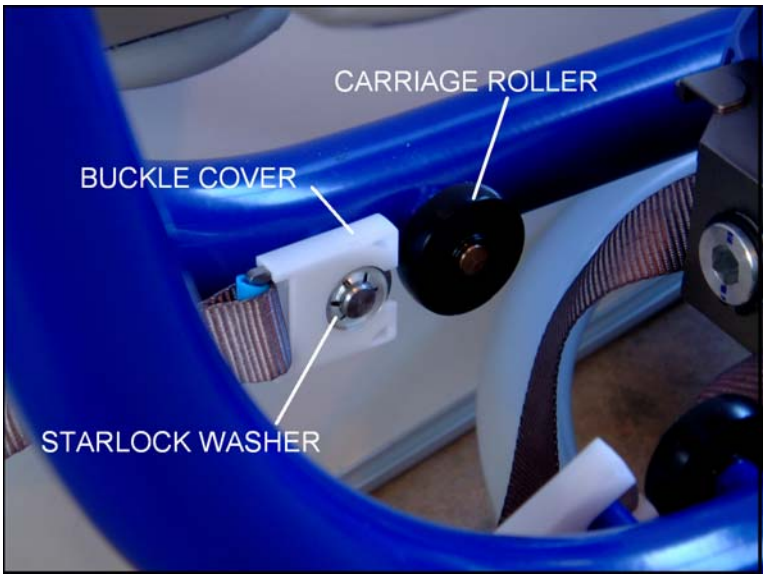
CAUTION: WHEN REMOVING A POWERED DPS JIB DISCONNECT THE ELECTRICAL SPADE CONNECTORS FROM THE STAINLESS BUS BARS AND PULL OUT THE CONTACT PLUNGER BEFORE REMOVING THE JIB. FAILURE TO DO THIS COULD CAUSE DAMAGE TO THE PLUNGERS.



Pull out the contact plunger

- Carefully slide the jib up the mast enough to gain access to the lift bands then remove the starlock washers and release the lift bands and buckles from the carriage in the jib: refer to Figure below.

- Carefully slide the jib from the mast making sure not to lose the four carriage rollers:



- If fitted with a powered DPS visually check the bus bars for wear, damage or contamination. If necessary recommend replacement.

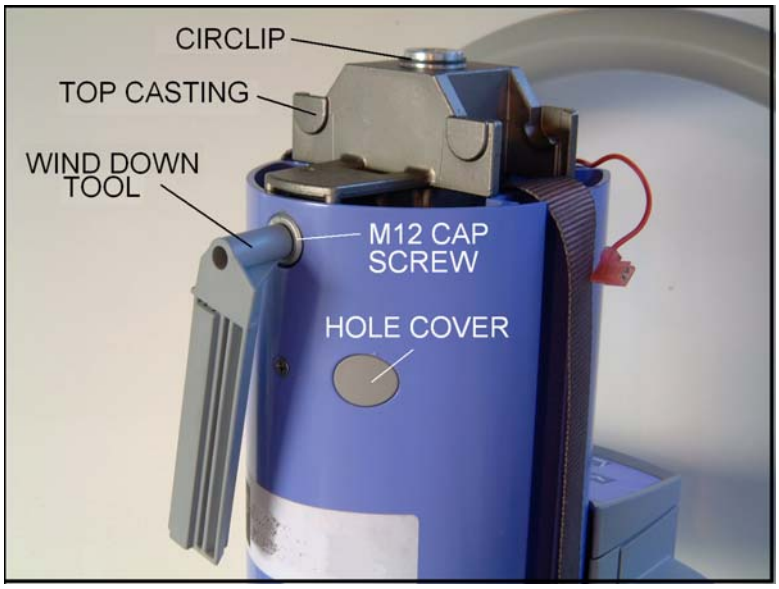
- Carefully position the hoist upright.

- Hold the weight of the outer mast and using the Wind Down Tool remove the M12 cap screw from the top of the mast. **NOTE:**The M12 cap screw is a hand tight fit and should not be over tightened.

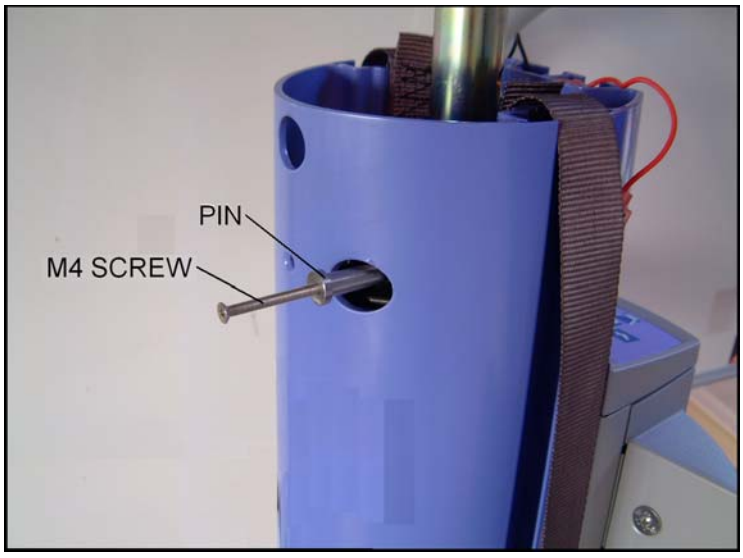
- Remove the circlip from the top of the actuator.

- Carefully remove the outer mast top casting and the friction washer from the top of the actuator.

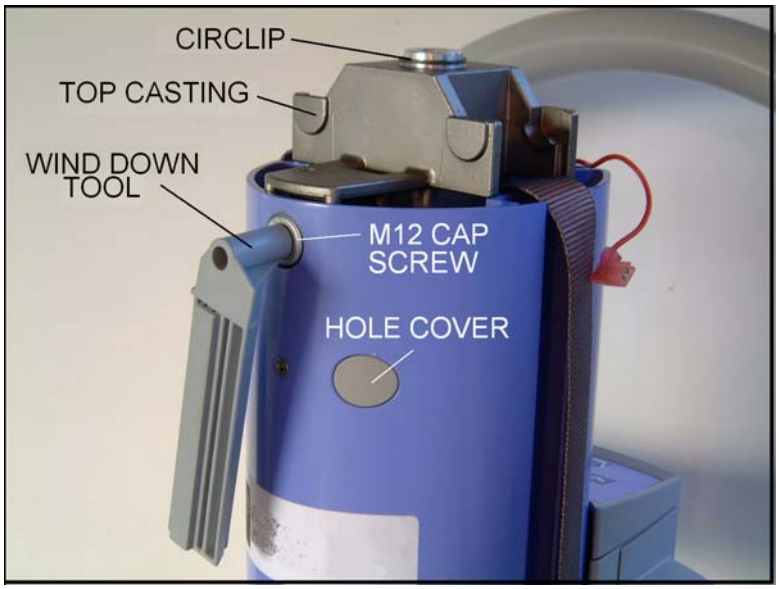
- Remove the screw that retains the hole cover to the mast. Remove the hole cover.



Install an M4 screw (slave item) to the pin and carefully pull the pin from the inner casting enough to remove the lift band.

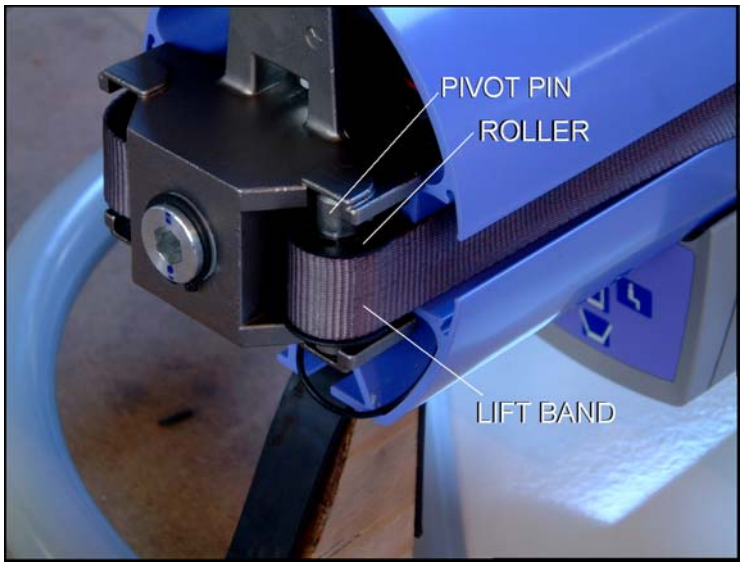


- Install the new lift band making sure that the flush side of the lift band is facing outwards.
- Push the pin through the lift band and under the spring that retains the pin in position. Remove the M4 screw from the pin.
- Repeat procedure on the remaining lift band.
- Make sure the friction washer is installed in the mast top casting and apply grease to the end face and bore of the friction washer.
- Install the hole cover and retain with the screw:.

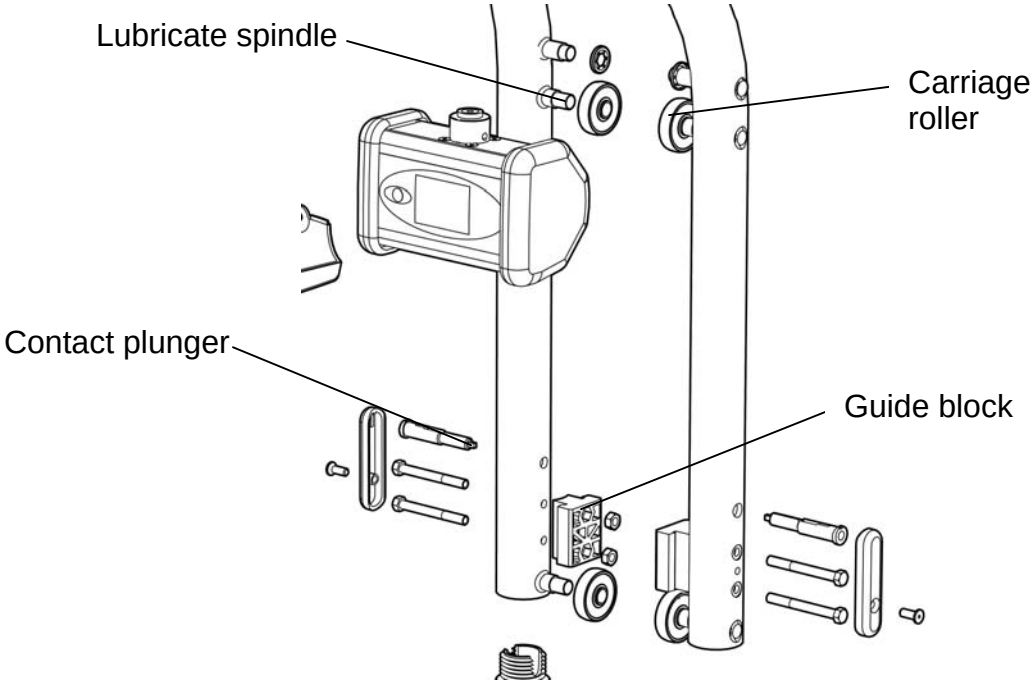


- Install the outer mast top casting and using the Wind Down Tool rotate the actuator to align the M12 cap screw clearance hole in the actuator with the M12 cap screw clearance hole in the outer mast. Make sure that the clearance hole in the actuator aligns with the M12 cap screw installation hole in the outer mast.
- Install the M12 cap screw. Use the Wind Down Tool to tighten the M12 cap screw this is a hand tight fit and must not be over tightened. Install the circlip to the actuator.

- Lightly lubricate the roller pivot pins:



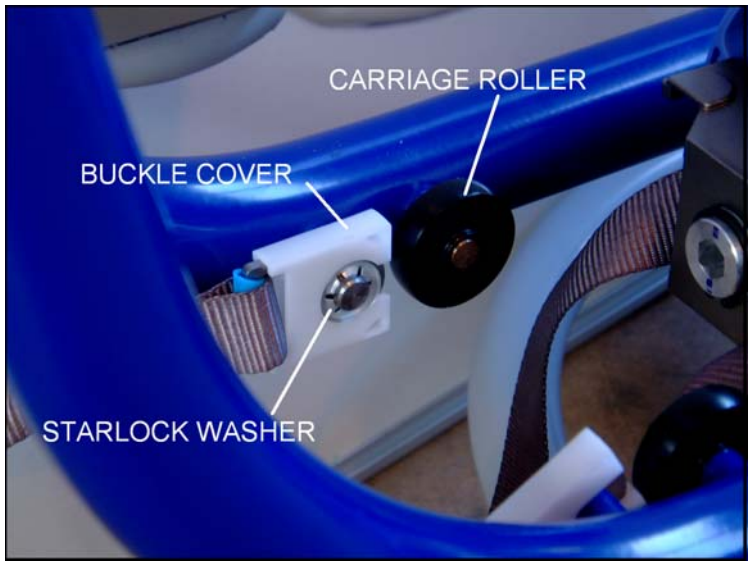
- Check the the carriage rollers and the guide blocks on the jib. Replace if necessary. Lightly lubricate the roller spindles and guide blocks.
- Protect the push handle and carefully lay the hoist on the push handle.
- Attach the four carriage rollers.



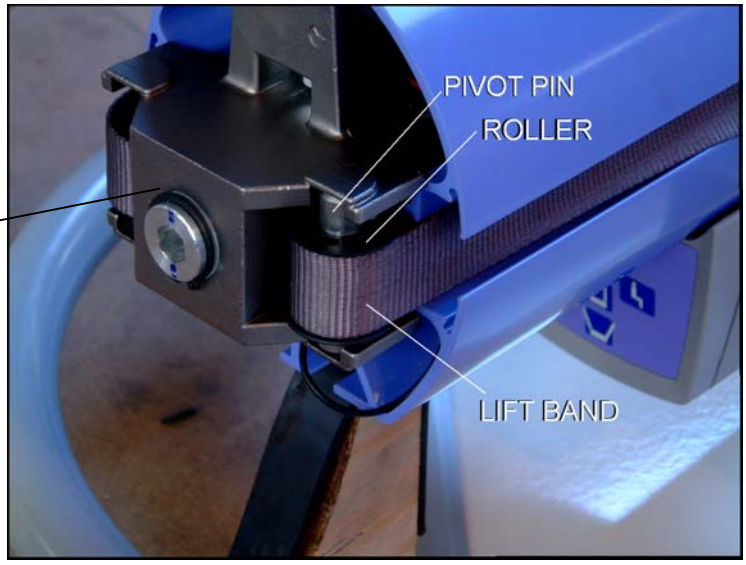
NOTE: When re-fitting a powered DPS jib be careful not to damage the two electrical contact plungers when sliding the jib on to the mast.

- Locate the two lower carriage rollers in the mast.

- Attach the lift band and buckle cover to the jib spindle, retain in position with a new starlock washer using ST295 (Starlock Washer Installation Tool). Repeat this process on the remaining lift band.



- Install the roller and pivot pin to the outer mast top casting. Make sure that the dimple in the pivot pin locates in the domed protrusion on the outer mast top casting.



- Carefully slide the jib assembly down the mast making sure the lift bands and buckle covers are retained with the starlock washers and located correctly on the rollers.

NOTE: When re-fitting a powered DPS jib it will be necessary to re-connect the electric spade connectors to the stainless bus bars located on the outer mast.

- Carefully position the hoist upright.
- Attach the Wind Down Tool in the mast assembly.
- Install the top cover with the slotted screw .
- Connect the handset and battery and attach the spreader bar.

- Function check the hoist according to section *12 Monthly Service Procedure*, page 16
- Refer to section *Load Test* on page 29 and perform a Load Test (local requirement).

Mast Actuator Removal and Replacement

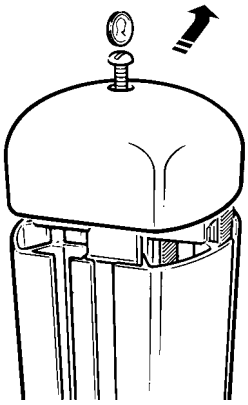
(Torques and consumable material according to page 10-15).

WARNING: OBEY ALL RELEVANT SAFETY PRECAUTIONS.

Position the hoist in a suitable work area that will allow enough room to remove the mast assembly from the chassis.

- Operate the handset or mast keypad to raise the lift arm to approximately its mid lifting height.
- Remove the battery and disconnect the handset.
- Remove the spreader bar.
- Remove the top cap from the mast:

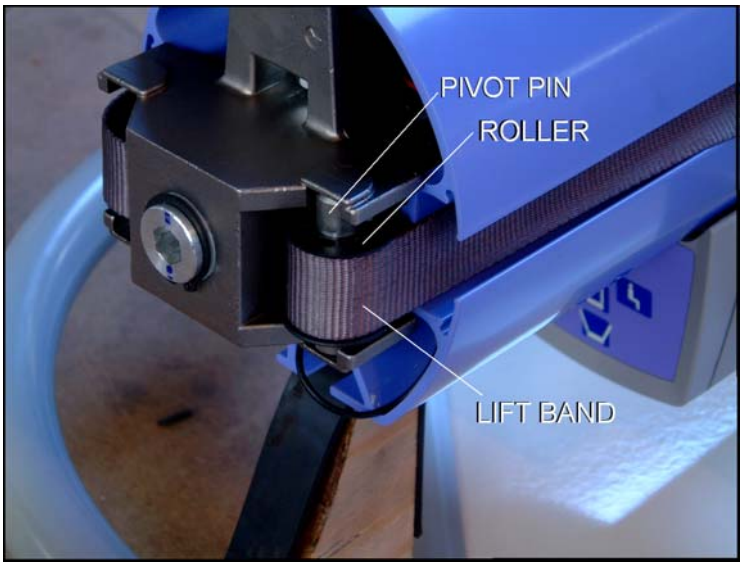
Top Cap (Mast)



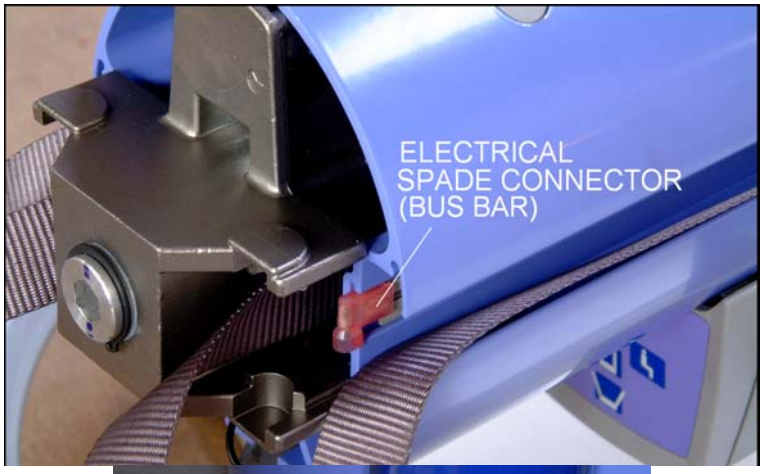
Protect the push handle as necessary and carefully lay the hoist on the push handle.

NOTE: Laying the hoist in this position eases any weight restraint of the jib by the engineer while disconnecting the lift bands and associated details. However, if preferred the jib can be removed from the mast with the hoist in the upright position.

- Remove the pivot pin and roller from each side of the mast.



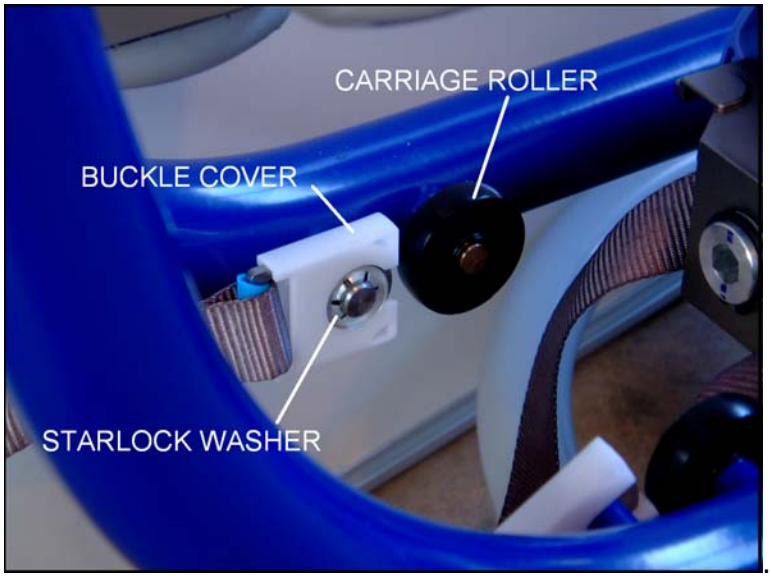
CAUTION: WHEN REMOVING A POWERED DPS JIB DISCONNECT THE ELECTRICAL SPADE CONNECTORS FROM THE STAINLESS BUS BARS AND PULL OUT THE CONTACT PLUNGER BEFORE REMOVING THE JIB. FAILURE TO DO THIS COULD CAUSE DAMAGE TO THE PLUNGERS.



Pull out the contact plunger

- Carefully slide the jib up the mast enough to gain access to the lift bands, remove the starlock washers and release the lift bands and buckles from the carriage in the jib:.

- Carefully slide the jib from the mast making sure not to lose the four carriage rollers:



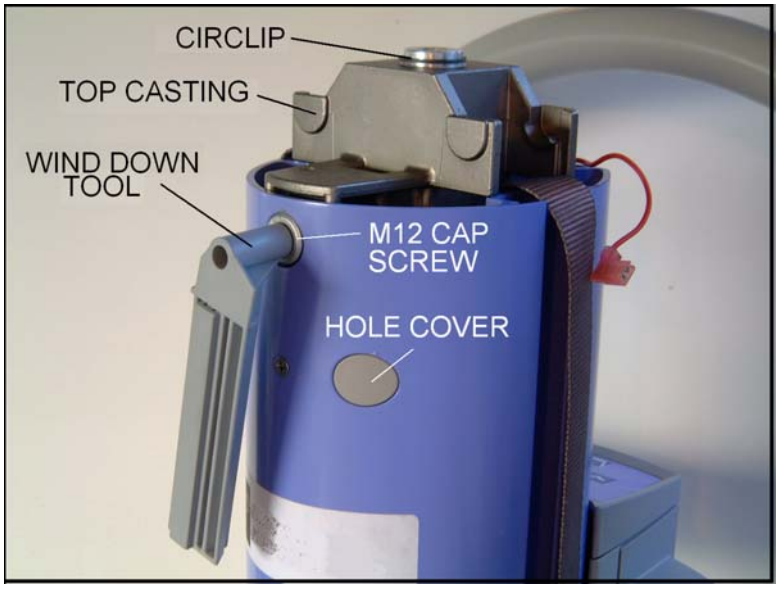
Carefully position the hoist upright.

- Hold the weight of the outer mast and using the Wind Down Tool supplied with the hoist remove the M12 cap screw from the top of the mast.

- Remove the circlip from the top of the actuator.

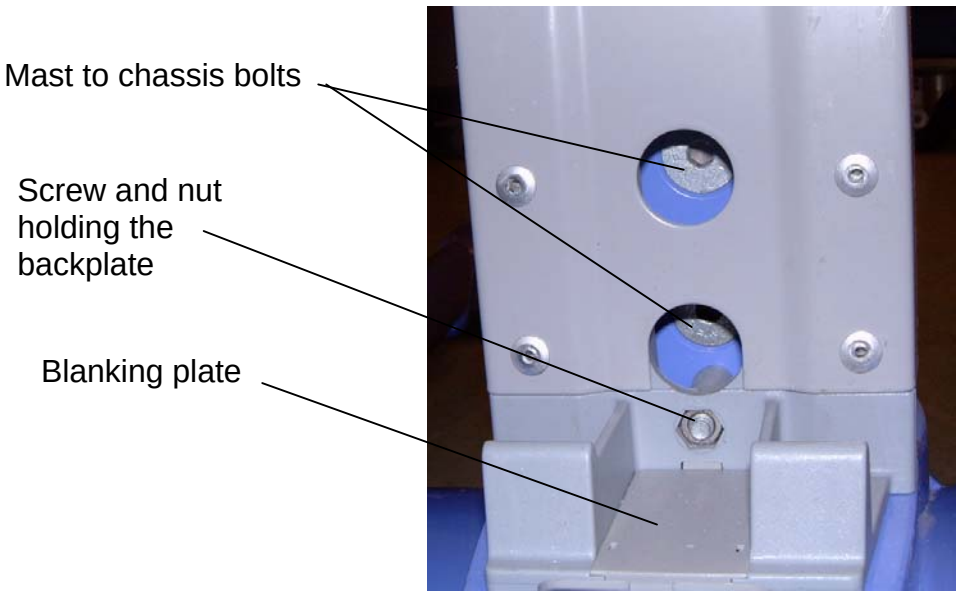
- Carefully remove the outer mast top casting and the friction washer from the top of the actuator.

NOTE: The M12 cap screw is a hand tight fit and should not be over tightened.

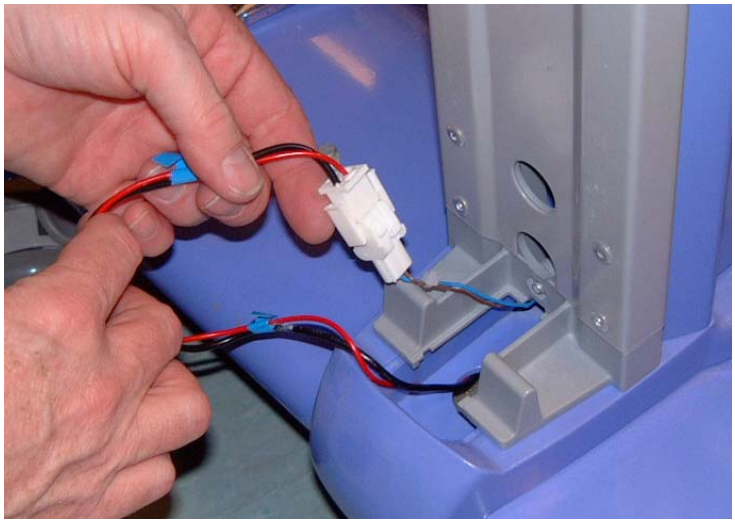


WARNING: DO NOT POSITION YOUR FINGERS BETWEEN THE INNER AND OUTER MAST WHEN REMOVING THE MAST TO CHASSIS BOLTS.

- Use a 6mm Socket Allen Key to remove the two M10 countersunk mast to chassis bolts :



- Carefully remove the blanking plate by depressing and sliding it back to gain access to the mast to chassis electrics. Disconnect the mast to chassis electrics.



- Lift the mast assembly clear of the chassis and carefully place in the horizontal position on ST296 (Mast Support Cradles).

- Using a 4mm Ball End Allen Key remove the M6 screw and nut that retains the back plate to the mast.

CAUTION: DO NOT DAMAGE THE WIRING LOOM THAT IS LOCATED IN THE INNER MAST CHANNEL.

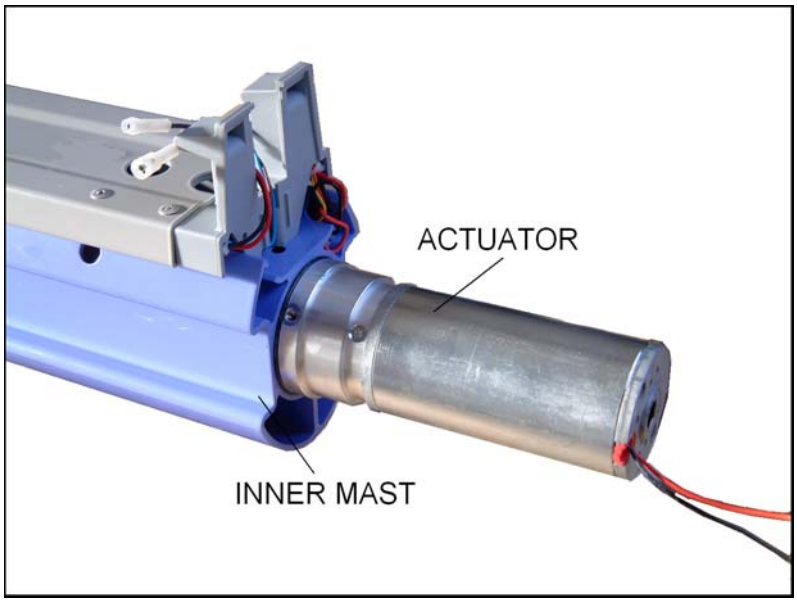
- Disconnect the electrics in the base of the mast from the actuator .

- Carefully route the two actuator wires from the actuator motor back through the inner mast channel location hole.

- Use a 5mm Socket Allen Key to remove the four M6 cap head screws and spacers that retain the actuator in position.

- Carefully ease the actuator out from the bottom of the inner mast, motor first .

NOTE: To ease disassembly it may be necessary to manually unwind the actuator stabilising tube in top of the actuator so that it just protrudes above the top of the outer mast. This enables you to push the actuator from the top end of the mast.



- Lubricate the inside of the inner mast and the o-ring on the plastic sleeve on the actuator.

- If lubrication of the existing actuator is required use grease on the screw thread or if required install the new actuator. Make sure to align the holes in the actuator with the cap screw holes in the outer mast.

- Install the spacers to cap head screws and apply Loctite to the threads of the cap screws.

CAUTION: DO NOT DAMAGE THE WIRING LOOM THAT IS LOCATED IN THE INNER MAST CHANNEL.

- Install the four cap screws and spacers to the inner mast using torque.

- Carefully re-route the actuator cables through the installation hole in the inner mast into the channel in the inner mast. Carefully ease the cables out of the bottom end of the inner mast.

CAUTION: DO NOT DAMAGE THE WIRING LOOM THAT IS LOCATED IN THE INNER MAST CHANNEL.

- Connect the electrics in the base of the mast and carefully ease them back into the inner mast channel. Make sure that the cables are clear of the installation faces between the mast and chassis. This is necessary to avoid damage to the cables when the mast is installed to the chassis.

- Carefully lift the mast and install to the chassis making sure not to trap any cables.

- Apply Loctite to the threads of the two M10 countersunk mast to chassis bolts. Install using torque.

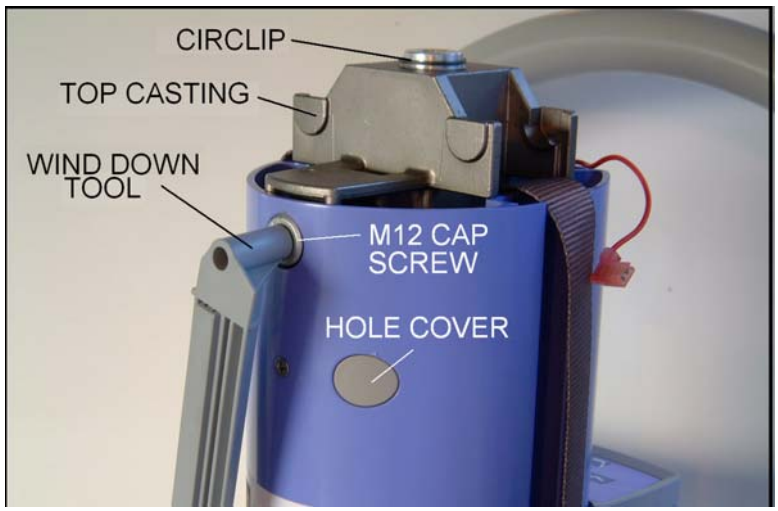
- Connect the mast to chassis electric cables and install the blanking plate.

- Install the friction washer to the top end of the actuator.

- Apply grease to the end face and bore surface of the outer mast top casting.

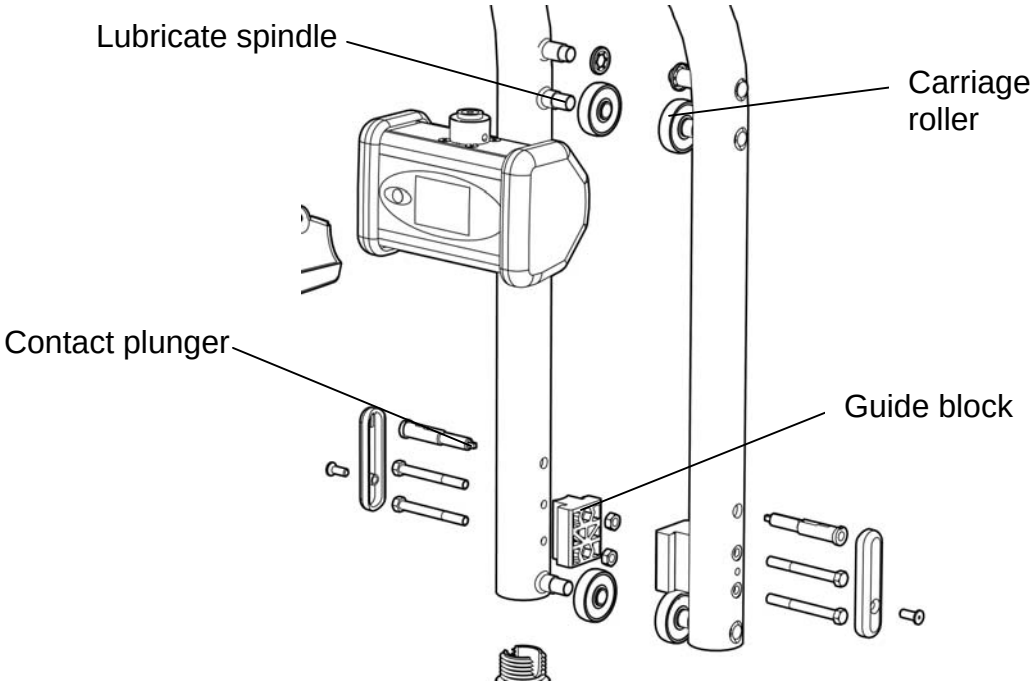
- Install the outer mast top casting and using the Wind Down Tool rotate the actuator to align the clearance bore in the actuator with the M12 cap screw installation bore in the outer mast.

- Install the M12 cap screw and use the Wind Down Tool to tighten the M12 cap screw noting that this is a hand tight fit and must not be over tightened. Install the circlip.

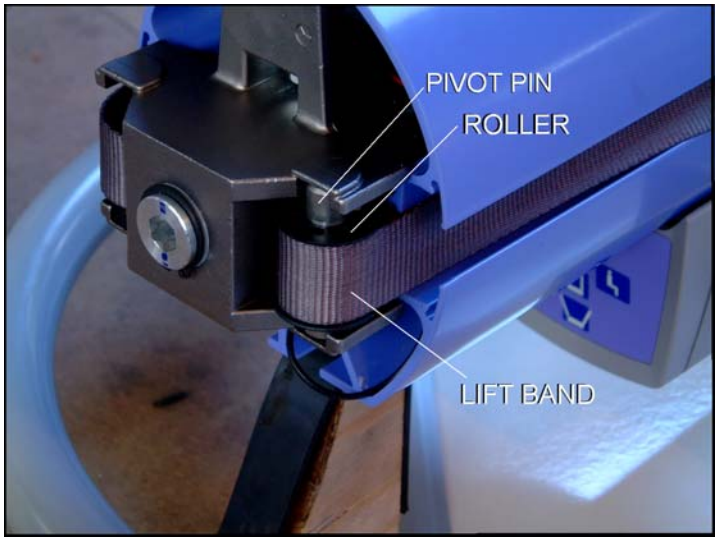


- Check the condition of the carriage rollers and the guide blocks. Replace if necessary.

- Lightly lubricate the roller spindles and guide blocks on the jib.



- Lightly lubricate the roller pivot pins.

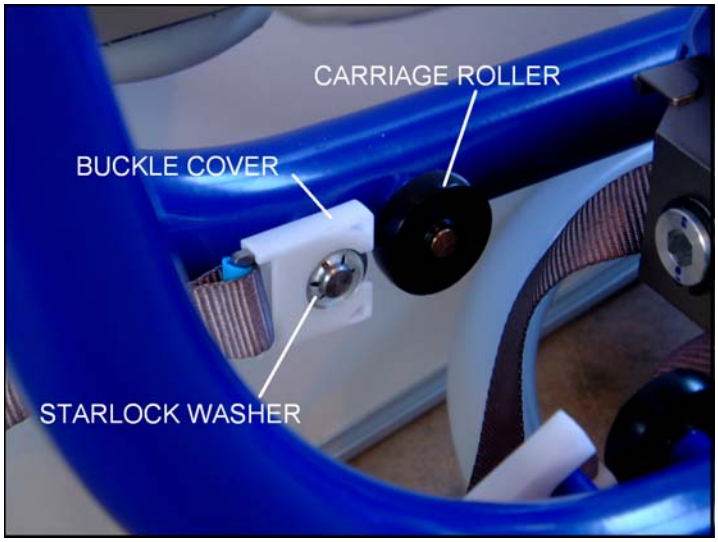


Protect the push handle as necessary and carefully rest the hoist on the push handle.

- Attach the four carriage rollers to the jib assembly and locate the carriage rollers in the mast.

NOTE: When re-fitting a powered DPS jib be careful not to damage the two plungers when sliding the jib on to the mast..

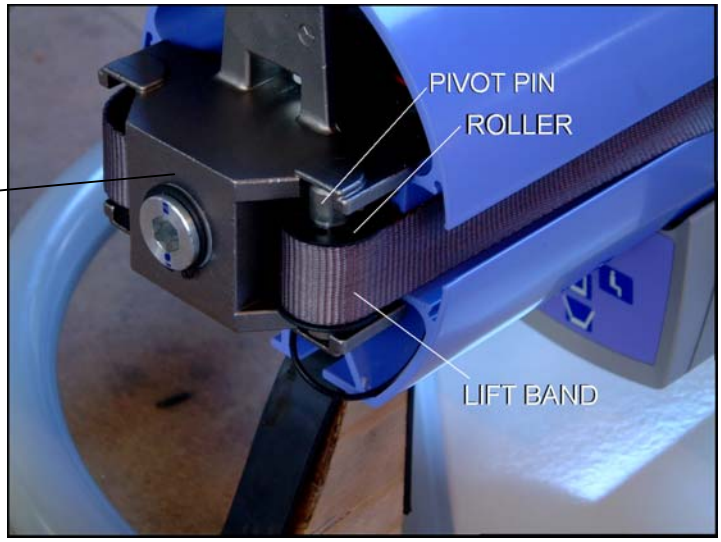
- Attach the lift band and buckle cover to the jib spindle then retain in position with a new starlock washer using ST295 (Starlock Washer Installation Tool). Repeat this process on the remaining lift band.



- Slide the jib assembly down the mast enough to gain access to the outer mast top casting .

- Install the roller and pivot pin to the outer top mast casting. Make sure the dimple in the pivot pin locates in the domed protrusion in the top mast casting.

Outer top mast casting



NOTE: When re-fitting a powered DPS jib it will be necessary to re-connect the electric spade connectors to the stainless steel bus bars located on the outer mast.

- Carefully slide the jib down the mast making sure the lift bands and buckle covers are retained with the starlock washers and located correctly on the rollers.

Carefully position the hoist upright.

- Attach the Wind Down Tool in the mast assembly , install the top cover with the slotted screw, connect the handset and attach the spreader bar and battery.

- Function check the hoist according to section *12 Monthly Service Procedure*, page 16

- Refer to section *Load Test* on page 29 and perform a Load Test (local requirement).

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